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APPARENTLY TRIVIAL HEAD INJURIES

BY

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BRIAN BROWNSCOMBE, M.B. LOND.
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A PRELIMINARY survey of cases of head injury admitted during 1939–40 to an E.M.S. Hospital has revealed many points of interest, and one group of apparently trivial injuries demonstrated the need for careful investigation and treatment. The group consisted of 53 cases with the following features: all the patients were said to have had a period of unconsciousness after the injury; most of them had sustained scalp wounds; and in none was there clinical or radiological evidence of fracture of the skull. In most cases it was not possible to learn the nature of the blow. Many of the patients had no memory of the way in which the injury was received, and others had been injured partly by flying fragments and partly by being driven against some hard object.

Most of the cases reached this hospital within 48–72 hours of injury and in the course of routine evacuation from hospitals in or near London. They were not specifically referred to the head-injury centre, and it may therefore be concluded that the patients were believed to have sustained minor injuries only and were not regarded as in need of special investigation or treatment.

Of the 53 cases, 27 had been operated on elsewhere before admission, 9 had had no operative treatment, while 11 had no external wound. Of the 27 cases operated on elsewhere—by different surgeons in various institutions—there was primary healing in 2 only. The reasons for these imperfect results were revealed by the appearance of the wounds at the time of admission. Many had retained foreign bodies, few had complete excision of dead tissue round the wound, and in almost all no more than an inch of scalp had been shaved round the wound. In all cases the wound had been closed with but one layer of widely separated sutures. The suturing material was fishing gut in most cases, catgut in a few and silk in one only. In many cases there was considerable tension on the stitches with resulting swelling, œdema and hæmorrhage of the scalp. At the time of admission, or shortly afterwards, all the wounds were discharging pus.

It would be unfair to comment too critically on these results, having in mind the circumstances in which treatment may have had to be carried out, but it may be emphasised that the necessity for urgent excision is not so great with head wounds as it is said to be with wounds in other parts of the body, particularly when the intracranial contents are involved. Most cases of the kind, without suffering harm from the delay, can well be dealt with by a first-aid dressing and transferred some hours later to special centres where there are facilities for more complete investigation and treatment.

PRELIMINARY TREATMENT AND EXAMINATION

At this hospital each patient, whether his injury appears slight or serious, is put to bed, kept warm, given fluids and relieved from pain and restlessness when these are present by the hypodermic administration of codeine phosphate or soluble phenobarbitone in appropriate dosage. In the more seriously injured patients intravenous saline or serum has sometimes been found necessary to combat the shock which, although so often present, is too rarely noticed. In cases admitted directly to the special head centre this form of treatment is normally continued for the first 24 hours after the injury, when a thorough neurological examination is carried out. Since the abnormal physical signs in these cases are comparatively slight, their presence is confirmed by a second observer before they are recorded, and their disappearance by the time of the patient's discharge from hospital is the criterion by which their relation to the injury is presumed. The information thus gained is supplemented by a complete radiological examination of the skull and by lumbar puncture and examination of the cerebrospinal fluid and its pressure. On these facts it becomes possible to assess the nature and gravity of the injury and to determine the line of treatment to be followed.

Clinical examination revealed abnormal physical signs in 29 of the 53 cases, an abnormally raised or lowered intracranial pressure (as measured by lumbar puncture) in 19, and the presence of blood in the cerebrospinal fluid in 16. No less than 41 (77%) showed evidence of physical signs in the central nervous system.

Clinical findings.—In the two groups—those with abnormal changes in the cerebrospinal fluid and those without—the clinical findings did not differ materially. *Pupillary changes* included inequality of the pupils (15 cases) and abnormalities of pupillary form and reflex activity; 6 cases showed definite nystagmus or nystagmoid jerkings to one or both sides. *Motor changes:* 1 case had a hemiplegia with diminished deep reflexes, 1 a brachial and facial paresis on the same side; both of these were found to have a subdural hæmatoma and recovered after this had been evacuated through burrholes in the skull. Another patient showed slight paresis of one leg without reflex changes. *Reflex changes:* in 2 cases the abdominal reflexes were bilaterally abolished and in 1 the tendon jerks were lost in both lower limbs. *Mental changes* were present in 7 cases, evidenced by disorientation, inability to concentrate, irritability, lack of insight. All these abnormal signs had disappeared before discharge from hospital, which points to the determining rôle of the craniocerebral injury in their production.

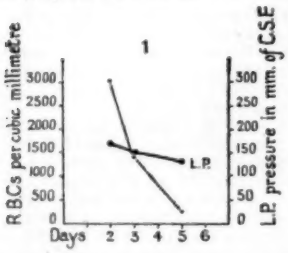
Case	Age	Sex	C.S.F. pressure	Red cells in C.S.F. (per c.mm.)	Wound of scalp	Case	Age	Sex	C.S.F. pressure	Red cells in C.S.F. (per c.mm.)	Wound of scalp
1	21	M	220	0	–	16	47	M	170	3040	+
2	20	M	190	0	–	17	46	M	200	80	+
3	17	M	200	0	–	18	62	M	215	314	+
4	30	F	200	0	–	19	16	F	225	2 present at repeated punctures	+
5	24	M	180	0	+						
6	34	M	185	0	+						
7	30	M	230	0	+	20	78	M	160	2490	+
8	25	M	210	0	+	21	36	F	225	+ + 1st count, 316	+
9	43	M	250	0	+						
10	71	M	70	0	+	22	52	M	90	970	+
11	31	M	140	144	+	23	68	F	130	+ + +	+
12	30	F	220	+ + + 1st count 25,600	+					1st count, 16,400	
						24	31	F	200	3 present at repeated punctures	+
13	70	F	150	few	+						
14	53	F	260	0	+						
15	67	M	200	+ + + 1st count 7220	+	25	23	F	410	650	+
						26	23	M	110	30	+
						27	60	F	120	24	–

Cerebrospinal fluid.—In 27 cases (over 50%) there was abnormal intracranial pressure, or blood in the fluid. There was no constant relationship between abnormal clinical signs and the state and pressure of the fluid; abnormal physical signs were present in 15 cases with fluid abnormalities, and in 14 cases in which the fluid and its pressure were normal (see table).

It has been said that an œdematous brain firmly pressed against the overlying membranes as a result of a raised intracranial pressure may make bleeding from small vessels on the brain surface impossible, and that to lower a raised intracranial pressure by the withdrawal of cerebrospinal fluid is to risk an increase or a recrudescence of bleeding. The graphs give the red-cell count in the fluid at each puncture, together with the pressure noted at the time in 6 cases; they afford no support to this view and even suggest that a low pressure may reduce the degree of bleeding. Another view is that withdrawal of bloodstained cerebrospinal fluid when there is intracranial bleeding helps to prevent the blocking of the arachnoid villi by red cells, and thus encourages the normal absorption of the fluid by these channels. Alternatively, it has been suggested that the amount of blood removed by lumbar puncture is so small as to be of relatively little use in this way. Whatever the truth about this, there can be no doubt that repeated lumbar puncture reduces headache, and in the cases here reported the relief obtained in this way and the

improvement in the patient's general condition were striking. The ill effects that may follow withdrawal of cerebrospinal fluid in cases of intracranial tumour were never observed.

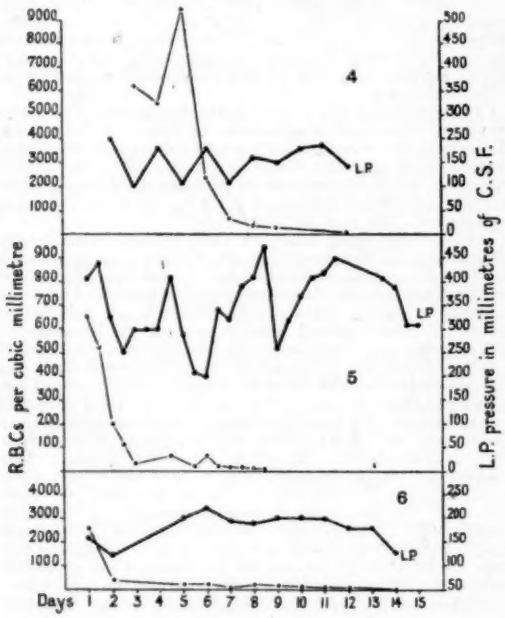
It seems probable that the degree of bleeding depends largely on the intracranial venous pressure. When there are torn veins, œdema of the brain, and a high intracranial pressure there is a considerable rise of intracranial venous pressure and hæmorrhage takes place freely. If, by dehydration, the intracranial pressure is lowered the intracranial venous pressure should fall also, and bleeding from torn veins should occur less readily. The present series certainly does not support the belief that lowering intracranial pressure promotes further hæmorrhage.



RESULTS AND PATHOLOGY

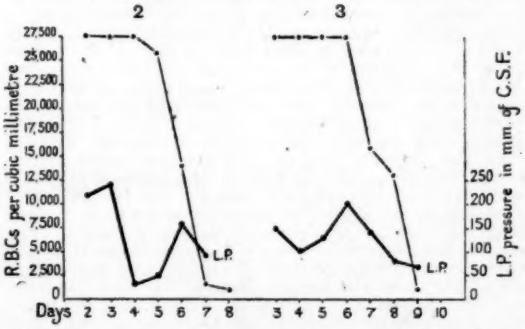
There were no deaths among our 53 cases, and all but one of the patients were discharged from hospital free from symptoms. The single exception was a man of 78 in poor general condition who, in addition to his head injury, had sustained crushing of both feet. Even this patient had no signs or symptoms referable to the central nervous system on transfer to another hospital. Follow-up is being undertaken, but evacuation and other factors make it difficult.

In the absence of any post-mortem investigations we can only infer the nature of the intracranial lesions. The presence of abnormal clinical signs referable to the central nervous system, and their disappearance under observation, show that in 41 of the 53 cases a recoverable injury to the brain had been sustained. The presence of blood in the cerebrospinal fluid in 16 cases indicates the occurrence of at least a moderate degree of bruising or contusion of the brain. The 5 cases with a red-cell count in the C.S.F. of over 1000 per c.mm. would probably have shown cortical laceration. The rapidity of recovery in the cases with normal intracranial pressure and cerebrospinal fluid show that the injury present must have been of a minor character. The contre-coup lesion in some cases of injury may be a laceration of the brain or its coverings, but it is reasonable to suppose that less severe injuries from this cause may consist of a local œdema only. Such a minor cerebral contre-coup lesion might well be associated with a normal intracranial pressure and a C.S.F. free from blood, and yet give rise to abnormal clinical signs. Moreover, the apparently slight injuries in this series may later be capable of producing areas of local cortical atrophy such as are demonstrable by encephalography in some severe cases within a few weeks of injury, which may be revealed by this means or at autopsy in patients with a history of head injury long before.



PRACTICAL POINTS IN TREATMENT

In initial treatment of the scalp wound the essentials for securing primary healing are a clean skin-field, which can be obtained only by wide shaving of the scalp, washing with ordinary soap and water and subsequent cleansing with spirit and bichloride of mercury, total excision of all damaged tissue, removal of foreign bodies, and suturing of the galea and skin in two layers without tension by closely approximated black silk sutures. Even when there is severe loss of scalp tissue suture without tension can usually be achieved by separating the scalp from the pericranium widely in all directions, or by making an additional incision running off at an angle from the main wound. If these essentials are borne in mind the majority of wounds of this kind will heal and will allow of the removal of all the stitches on the third day. In view of the underlying intracranial injury present in so many of the cases, local anæsthesia with 1% Novocaine should be employed whenever possible. As a rule the patients tolerate this well and are coöperative.



Treatment of the underlying brain injury is essentially simple and consists in measures directed to maintaining intracranial pressure at a normal level, whether it be high or low initially. The steps are threefold: regulation of fluid intake, elimination of fluid by the bowel, and direct removal of C.S.F. from the spinal theca by lumbar puncture. The first step is easily taken by allowing only 30 oz. of fluid by mouth daily; this can be reduced later to 20 oz. if the intracranial pressure does not fall rapidly, or increased to 50 oz. daily if the patient becomes dehydrated, showing increasing physical signs, a dry coated tongue or a low intracranial pressure. Fluid can most satisfactorily be eliminated by the bowel by slowly running into the rectum 2 oz. of a saturated solution of magnesium sulphate and instructing the patient to retain this as long as possible. This procedure may be carried out once, twice or even more often daily when intracranial pressure is high. Routine lumbar puncture still further reduces a high intracranial pressure by the direct removal of fluid, and it is usually desirable to remove at each puncture as much fluid as is necessary to bring the pressure down to, or below, the normal level. Thecal puncture may have to be repeated as often as four-hourly in some cases, while in others the daily withdrawal of fluid is adequate.

SUMMARY

A series of 53 cases of apparently trivial head injury is reported, many with scalp wounds but none with fracture of the skull.

Operation had been performed elsewhere on 27 of the patients, but primary healing had occurred in only 2;

many had retained foreign bodies, most had only an inch of scalp shaved round the wound, and widely separated through and through sutures, usually of fishing gut, had been used.

Abnormally raised or lowered intracranial pressure (as measured by lumbar puncture) was found in 19; blood was present in the C.S.F. in 16; 41 (77%) showed abnormal physical signs referable to the central nervous system.

Lumbar puncture did not increase intracranial bleeding; the results even indicated that lowering the pressure may reduce bleeding.

The intracranial pressure should be maintained at normal level by regulation of the fluid intake, elimination of fluid by the bowel, and judicious use of lumbar puncture.

The scalp wound should be treated by wide shaving of the scalp, cleansing, total excision of damaged tissue and removal of foreign bodies, and suture of the galea and skin in two layers without tension by closely approximated silk sutures.

At the time of injury many cases can be treated best by the application of a first-aid dressing and transfer to a centre where there are adequate facilities for investigation and treatment.

"SUBSTANCE B" OF DIPHTHERIA TOXIN AND DIFFUSING FACTOR

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O'Meara (1940, 1941) has recently put forward a conception of the toxæmia of diphtheria which depends on the hypothesis that diphtheria toxin is composed of varying amounts of two substances, provisionally called substance A and substance B. The fraction of toxin which is of high lethal value for the guineapig and which predominates in the toxin as usually prepared from Park-Williams No. 8 strain is referred to by him as substance A, and that which predominates in saline extracts made from cultures of gravis strains on Loeffler's medium and in diphtheria toxin as produced in the body is referred to as substance B. O'Meara considers that the effect of the substance-B component of the toxin is to promote the penetration of the tissues by substance A, thus enabling it to cause its specific damage. He suggests that the synergic effect of these two substances accounts for the clinical characters of hypertoxic diphtheria and the disappointing results of serum therapy in cases of this type. O'Meara stated that substance B has properties in many respects similar to those of the diffusion factor which increases the permeability of the tissues (McClean 1930, 1931, Hoffman and Duran-Reynals 1931), and that evidence of their identity was accumulating. Since it has already been shown (McClean 1936) that specific antisera can be prepared against diffusion factors of bacterial origin, the possible identification of substance B as one of those agents held out the hope that effective antisera to this substance might be produced.

The suggestion that a diffusion factor obtained from saline extracts of gravis strains of *Corynebacterium diphtheriæ* might be responsible for the results recorded by O'Meara was of particular interest since an earlier investigation (McClean 1936) of the production of diffusion factor by *C. diphtheriæ* had indicated that, although some strains of this organism produce detectable quantities of this substance, none of them produce amounts comparable with those obtained from *Clostridium welchii*, streptococci, pneumococci or staphylococci. It was doubtful whether the diffusion factor produced by a few of the 79 strains examined was present in sufficient quantity to influence the character of the infection by these organisms. Moreover, there was no indication that the capacity to produce this factor was particularly associated with gravis strains; some mitis strains produced a greater degree of diffusion than many gravis and intermediate strains, and a few mitis strains caused diffusion equal to that produced by the more active strains of the other types. All these observations were made, however, on filtrates from broth cultures, and, in view of O'Meara's statement that substance B predominates in saline extracts of gravis strains grown on Loeffler's medium, it was decided to re-examine this question. Since there is no evidence that O'Meara has examined intermediate and mitis strains for their capacity to produce substance B, it was decided to include some of these strains in the series examined for diffusion factor.

Following the work of Chain and Duthie (1939) it has been shown that these diffusion factors are closely associated if not identical with mucolytic enzymes which hydrolyse the hyaluronic acid present in the mucin of synovial fluid, vitreous humour, umbilical cord and the skin (McClean and Hale 1941). This group of enzymes are therefore designated by the name "hyaluronidase." As a result of this work improved methods for the preparation of these enzymes have been developed and they can now be titrated by viscosimetric and other methods which are more accurate than the estimation of diffusing factor in the skin. In the light of this knowledge it is possible to form a more definite opinion as to the significance of the production of this substance by *C. diphtheriæ* than was possible in 1936.

The observations to be recorded here were strictly confined to the question whether strains of *C. diphtheriæ* of gravis, intermediate and mitis type produce significant amounts of hyaluronidase or diffusion factor, and whether there is any evidence of association between this factor and the substance B postulated by O'Meara. These observations do not, and were not intended to, elucidate the question whether a second component of diphtheria toxin exists or whether it plays the part described by O'Meara in the causation of hypertoxic diphtheria.

MATERIALS AND METHODS

Altogether, 50 strains of *C. diphtheriæ* were examined: 15 gravis, 13 intermediate and 22 mitis strains. The gravis strains included two derived from Dublin and reputed to be good producers of substance B; Dublin strain No. 38 was kindly supplied by Dr. O'Meara and Dublin strain No. 9 by Dr. Trevan of the Wellcome Physiological Research Laboratories. Six of the other gravis strains were freshly isolated, the remainder being from stock cultures. Seven of the intermediate strains were freshly isolated, the remaining six being stock cultures. Eight of the mitis strains were freshly isolated and fourteen, including the Park-Williams No. 8 strain, were from stock cultures.

In the earlier experiments, all the strains were cultivated for 48 hours in three different media: (*a*) a proteose peptone infusion broth containing 0·3% maltose; (*b*) a similar broth in which the maltose was replaced by 1% of a solution containing hyaluronic acid; and (*c*) on slopes of Loeffler's medium. The broth containing maltose was of the same composition as that employed in my previous observations on *C. diphtheriæ*; the hyaluronic-acid broth was used because it has been found that the inclusion of this substance in the culture medium greatly enhances the capacity of *Cl. welchii* and streptococci to produce hyaluronidase or diffusion factor (McClean and Hale 1941, McClean 1941). The growth on each serum slope was washed off in 0·5 ml. physiological saline and allowed to extract at room temperature for 48 hours in accordance with O'Meara's directions for obtaining substance B. The organisms were removed from the broth cultures and the saline extracts by centrifugation and the supernatant fluid tested for diffusing and hyaluronidase activity. Filtration was not employed.

In later experiments, when it had been established that any strain capable of producing diffusing factor or hyaluronidase produced the maximum amount in broth containing hyaluronic acid, we discontinued the use of the other two media for all the strains. Only those strains producing diffusing factor were then cultivated on Loeffler's medium in order to determine whether this factor was present in the saline extracts.

Diffusing activity in the skin was tested by the method already described (McClean and Hale 1941), which depends on the determination of the highest dilution of the culture supernatant which will produce a significant (20%) increase of spread in the dermis. Isotonic hæmoglobin solution was used as diluent and as the coloured indicator of diffusion. Hyaluronidase activity was tested by a method already described (McClean 1941) which depends on determining the highest dilution which will inhibit the power of a mucin solution to form a typical "mucin clot" in the presence of acetic acid. Hyaluronidase activity can also be accurately

measured by viscosimetry, but this method is not suitable for weak preparations, since although it is accurate it is not sufficiently delicate to detect small amounts of the enzyme.

RESULTS

It is not proposed to give the results of the examination of all these strains in detail. It will suffice to state that out of the 50 strains examined only two gravis, one intermediate and three mitis strains produced significant diffusion in the skin and this only at a dilution of 1 in 2 of the culture supernatant fluid. Significant diffusion at a higher dilution could only be obtained with one gravis strain. All the other strains, even when grown in broth containing hyaluronic acid, failed to produce any diffusing factor or hyaluronidase; this suggests that these strains were incapable of elaborating this enzyme under the most favourable conditions. With the exception of one gravis strain, none of them produced sufficient enzyme to be detectable by the test for the destruction of the clotting power of mucin. Although the results of this test run pari passu with diffusing activity in the skin, it is not sufficiently delicate to detect an enzyme which fails to produce increased diffusion at a dilution of 1 in 10.

The two positive gravis strains produced an increase in the area of spread in the skin of 72% and 29% respectively in a dilution of 1 in 2 of culture supernatant in hyaluronic-acid broth. The more active strain of the two also produced a 44% increase of spread at a dilution of 1 in 10. The saline extracts of both of these strains failed to produce any diffusion in the dermis. The one positive intermediate strain only produced a 20% increase of spread at a dilution of 1 in 2 when grown in hyaluronic-acid broth. The three positive mitis strains produced an increase of spread of 29%, 18% and 38% at a dilution of 1 in 2 when grown in hyaluronic-acid broth. Saline extracts were inactive.

Neither of the Dublin strains, both reputed to be good producers of substance B, produced detectable amounts of diffusing factor even when they were cultivated in hyaluronic-acid broth. There was no trace of this enzyme in the saline extracts which, according to O'Meara, should have been rich in substance B. This fact, coupled with the observation that those strains which do develop diffusing factor in broth culture produce little or none in saline extracts of the organisms, is definite evidence that this factor cannot be associated with substance B. The general observation with these 50 strains and the 79 previously examined is that only a small proportion produce detectable amounts of this enzyme, and that none of them produce amounts comparable with the enzyme obtained from the gas-gangrene group, streptococci, pneumococci or staphylococci; this suggests that it is unlikely that this enzyme plays an important part in the symptom-complex of diphtheria.

In all the earlier work with this enzyme derived from testis and from other pathogenic organisms the diffusing activity in the skin was estimated by injecting dilutions of the enzyme together with a standard dose of the classical diphtheria toxin derived from P.W.8 strain. The size of the resulting diphtheria lesions in the skin was measured after 48 or 72 hours. If this enzyme had produced an aggressive action on the diphtheria toxin, similar to that described by O'Meara for substance B, it would have been expected that the resulting toxin lesions would have been more œdematous, hæmorrhagic and necrotic than the control lesions of diphtheria toxin alone. Even when many hundreds of minimal diffusing doses of the enzyme were injected together with the toxin, the lesion was normal in appearance apart from the fact that it was spread over a larger area of skin.

SUMMARY AND CONCLUSIONS

No evidence has been obtained of any association between diffusing factor or hyaluronidase and substance B postulated by O'Meara to be present in toxic diphtheria filtrates.

Only a small proportion of strains of *C. diphtheriæ* of any type produce detectable amounts of diffusing factor. Saline extracts of those strains that do produce this enzyme in broth culture show little or no diffusing activity.

The capacity to produce this enzyme is not confined to gravis strains; it can be detected in broth cultures of a few intermediate and mitis strains.

The amount of this enzyme produced by any strain is very small compared with that found in cultures of organisms of the gas-gangrene group, streptococci, pneumococci or staphylococci. In view of this fact, and the small proportion of strains from which the enzyme can be obtained at all, it is doubtful whether an enzyme of this nature makes any material contribution to the symptom-complex of diphtheria.

I am indebted to Dr. Robert Cruickshank of the North Western Group Laboratory, L.C.C., and Dr. Mary Barratt of the Lister Institute for the supply of freshly isolated cultures, and to Prof. J. W. McLeod of the Leeds school of medicine and the National Collection of Type Cultures for stock strains of various types.

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PEPTIC ULCER IN THE ROYAL NAVY

ÆTIOLOGY

By R. S. Allison, M.D. Belf., F.R.C.P.
SURGEON COMMANDER R.N.V.R.

Study of 100 naval ratings suffering from gastro-duodenal dyspepsia showed that about half of them had radiological evidence of ulcer. In almost all the cases the symptoms were typical and of long duration, and it was thought that the proportion diagnosed as ulcer was probably an underestimate of the true figures. The same patients were investigated further in order to assess the relative importance of certain recognised ætiological factors. Wherever possible the opportunity was taken of comparing the results with those obtained in a control series of 210 naval ratings who were also under observation at the time. Though all of these were sick they were not suffering from dyspepsia. The following points, specially, were made the subject of inquiry:

1. Age at which severe disabling dyspepsia was most common.

2. Influence of type of service; rating; type of ship; class of service.

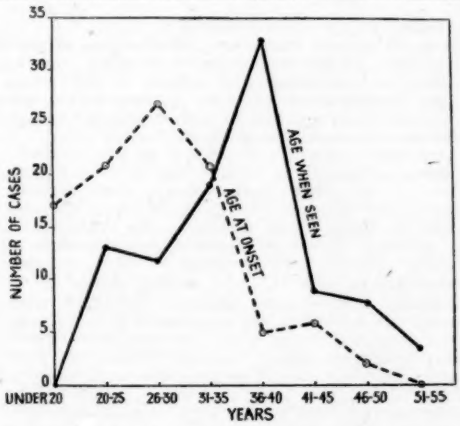
3. Mechanical and toxic factors; defective and septic teeth; irregularity of meals and bolting food; tobacco and alcohol.

4. Diet; pre-war and present diet; vitamin-C deficiency; food allergy and migraine.

5. Influence of anxiety related to home circumstances, service life, difficult duties, seasickness, lack of sleep, war experiences; relation of worry to dyspepsia.

Age.—Half of the dyspeptics in this series were between the ages of thirty and forty when they came under observation, and about a third were between thirty-six and forty. Only 27 patients were under thirty. The actual age of onset of the symptoms was considerably less. The difference between the two—age of onset and age when seen—is demonstrated in the figure. Though allowance must be made for the fact that 35% of the cases had been under treatment before, in peace-time, the curves show that the major proportion had had dyspepsia for some years before it became sufficiently bad to justify admission to hospital.

Type of service.—All the usual naval ratings were represented among the patients—e.g., seamen, stokers, marines, signalmen, telegraphists, cooks—and there was nothing to suggest that peptic ulcer was more prevalent in one branch of the service than another. The type of ship in which the 100 gastric patients and the control series of 210 non-gastric cases were serving at the time they went sick is shown in table I. The figures suggest that there was a higher proportion of dyspeptics in destroyers and small auxiliary craft than there were controls, but the numbers are too small and the scope of the comparison too limited to give them real statistical value. As regards class of service, comparison again



of the gastric with the non-gastric patients (table II) showed that there were more pensioners and Royal Fleet Reservists in the former group than in the latter, whereas the active-service ratings and Royal Naval Reservists were equally distributed. Men who had retired from the active list and been recalled at the outbreak of hostilities were more affected by dyspepsia in the first year of the war than those who were still serving or who were accustomed to seagoing in peace-time. This finding is in keeping with the previous observation on age, for the older men belonged mostly to the pensioner and fleet-reserve classes. It may help to explain the apparent frequency of dyspepsia in destroyers, for many of these ships which were in reserve were manned by pensioners and reservists at the outbreak of war. The low proportion of dyspeptics among conscripts and volunteers is probably also related to age, for these men were mostly in the 20–30 group, at which age severe dyspepsia was less commonly seen in the first year of war.

Mechanical and toxic factors.—The teeth were examined from a functional standpoint and for gross dental sepsis. In two or three cases they were insufficient for mastication or there were septic root stumps, but, as a whole, the dental state was much better than one would expect to find in a group of similar patients in civil life. As regards bolting food, the importance of this factor in causing indigestion in sailors was stressed by naval medical officers in the Report on the Health of the Navy for 1935 (p. 11), and the present experience is in accord with their views. Most of the young dyspeptics seemed to eat too much and to hurry over their food, paying insufficient attention to chewing, while in many of the cases of longer duration, the pensioners and reservists, it was evident that the sudden transition from home

TABLE I—SHOWING WHERE DYSPEPTICS AND CONTROLS WERE SERVING AT TIME OF ADMISSION

Where serving	Dyspeptics (%)	Controls (%)
Battleships, battlecruisers	1	1·4
Aircraft carriers	1	1·4
Cruisers	3	6·1
Armed merchant cruisers	2	3·8
Destroyers	22	9·4
Trawlers, drifters, mine-sweepers, patrol boats	35	27·3
Submarines	1	0
Depot ships	0	1·4
Training ships	0	0·5
Shore establishments	34	48·6

conditions, with their regular routine, back to service life had disorganised their carefully acquired habits of dieting themselves and taking plenty of time over meals. Irregularity of meal times and long periods without food were mentioned by a small proportion of cases only, probably because in ships this difficulty does not often arise, emergency rations being served when the duties are especially arduous or a regular meal impossible. Tobacco and alcohol may be used more by naval personnel than by civilians, but in this series 10% were non-smokers and 20% took no alcohol or very little. Periodic over-drinking when on shore leave, though less common today than formerly, seemed to have been a factor in initiating symptoms in a number of cases, and in some others for their recurrence. Excessive smoking (which was considered as anything above 2–3 oz. pipe tobacco or 100 cigarettes a week) was admitted by about a third of the dyspeptics.

DIET

Many patients attributed their indigestion to the diet, which they said was too heavy or too greasy. There was a general distaste for tinned food, and in some instances it was alleged meals were overcooked or "spoiled."

Prewar and war diet.—Those who blamed the diet specially were men who had been dieting themselves before the war (33%). They were pensioners, reservists, volunteers and conscripts and had been living at home before they were called up. Dieting had invariably been adopted on medical advice, though in many cases apparently there had been no preliminary investigation to confirm the presence of ulcer. They had been living principally on milk foods, fish, eggs, white meat, bread and butter. Fresh fruit was seldom taken regularly, many claiming that it disagreed with them and caused "acidity," or that they had been told to avoid it. Since recall or entry into the service, these patients had been on the ordinary naval rations. For breakfast they had porridge, fried bacon, egg or tinned sausage; for

TABLE II—CLASS OF SERVICE OF DYSPEPTICS AND CONTROLS

Class	Dyspeptics (%)	Controls (%)
Regular Navy	24	28·3
Pensioners'	17	8·5
R.F.R.	17	7·6
R.N.R.	7	7
R.N.V.R.	2	4·7
Volunteers (hostilities only)	24	25·5
Conscripts	8	17·4
T.124	1	1

Pensioners.—Men who served at least 22 years and qualified for pension. Employed in civil life until recalled for war service.
R.F.R.—Former period of active service. Civil occupation until recalled.
R.N.R.—Seamen in peace-time—e.g., merchant service, fishermen.
R.N.V.R.—Civilians doing short-period training with fleet annually in peace-time.
T.124.—Merchant seamen serving in ships taken over by Admiralty.

dinner roast beef, potatoes, cabbage, beans, tinned carrots or peas, suet pudding or jam roll; for tea bread and butter; and for supper a kipper, hash or tinned beef with pickles and cheese.*

While it is clear that the menu was sufficiently varied and nourishing for healthy men engaged in hard physical work, patients who had been previously dieting themselves obviously could not face it. Some, who were free of symptoms at the time, tried to eat everything at first; others modified the diet from the start. Hunger made many of them attempt a full meal in spite of pain, but this was almost invariably followed by more severe pain or by vomiting. In consequence, those who were at sea and could not supplement their rations by other items more to their taste gradually formed the habit of doing without meals and of substituting for them snacks of bread and butter, tea or a dose of alkaline powder, and this may explain the great loss of weight which many of them showed on admission to hospital.

Vitamin-C deficiency.—The results obtained by the methods in use for estimating vitamin-C deficiency appear to be somewhat unsatisfactory and variable. For example, many healthy subjects or convalescents on a full diet fail to excrete an excess of ascorbic acid after three repeated test doses of 300 mg. daily. In this series, the saturation test was performed on 84 patients and deficiency was not conceded unless it took more than three days (300 mg. ascorbic acid daily) for the urine to show evidence of saturation. Adopting this standard, 34 patients, or approximately 40% of the total, showed evidence of deficiency (table III) though there were no clinical indications of scurvy. Archer and Graham

* The list is made up from the statements of patients.

(1936) and others, have drawn attention to vitamin-C deficiency in peptic ulcer and in hæmatemesis, but from the present experience it seemed clear that any subscorbutic state was due not to a fault in the naval diet but to inability on the part of the dyspeptics to eat the sufficient and varied dietary provided.

Food allergy and migraine.—Many patients stated that certain articles of diet were liable to precipitate an attack of indigestion causing flatulence, heartburn or actual pain. The items mentioned most often were beef, pork, bacon, sausage, potatoes, cheese, pickles, vinegar, fruit and vegetables such as lettuce, celery, cucumber,

TABLE III—NUMBER OF DAYS ON 300 MG. ASCORBIC ACID REQUIRED TO PRODUCE SATURATION

Days	No. of cases	Days	No. of cases
4–5	10	8–9	10
6–7	12	10–12	2

tomato, pears, apples, oranges. Fried or fatty foods also were often cited. It was evident that part of the prejudice in many cases was based primarily on medical advice. They had been told what to avoid and had conformed strictly to the rules. It was natural that, since they had eaten the forbidden articles, these should be considered responsible for the recurrence of symptoms. In one case it was possible to obtain striking evidence of idiosyncrasy. This was a seaman (case 29) who said that vinegar upset him, causing stomach pain and irritation of the skin. Smelling a bottle of vinegar made him perspire freely and brought on abdominal pain, while rubbing a little vinegar gently on the skin caused an urticarial rash which was intensely irritating and disappeared only after several hours.

In a few cases, the intolerance to fat or special foods seemed to be related to migraine which was present either alone, and probably responsible for the gastro-intestinal disturbance, or associated with ulcer. In the dyspeptic series 14 patients complained of headache and in 10 of these the description suggested migraine. The following is an example:

CASE 22.—Able seaman, R.F.R., aged 34. Tendency to recurring indigestion and headaches since boyhood. Joined Navy at 17 and from the start of his service career suffered from seasickness. Sick if compelled to travel in a bus for a long distance. When at sea liable to severe headaches, felt on either side in the parietal region or in the occipital region, and throbbing in character. After an hour or so often goes "blind," "a deep red mist" spreading over the vision. In this state he bumps into objects on deck and once or twice has nearly gone over the side. The visual disturbances never last longer than half an hour. On returning to civil life in 1935, when he went on the reserve, he continued to get the severe headaches periodically. They could be brought on by eating cheese, corned beef or rice, and for some hours he would be prostrated by them. In 1935 he began to get definite epigastric pain 2–3 hours after food which was relieved by taking more food or alkali. The pain felt like "acute hunger." Sometimes he had the headache as well as the pain but there was no recurrence of the blindness. Since his recall in September, 1939, for war service, he has been serving in a destroyer, and has had intensified symptoms of recurring pain, headache and blindness.

The provisional diagnosis in this case was migraine made worse by seasickness. Ulcer was thought to be unlikely. Radiography, however, showed that the duodenal cap was deformed and tender, and that an ulcer was present.

Only 2 cases with migraine showed positive radiological evidence of ulcer and it was noteworthy that in no instance was there any evidence of disease of the gall-bladder or of gallstones. The two syndromes—migraine and ulcer—were either closely related in time, or the migraine had preceded the duodenal symptoms and been replaced by them. In the latter type it was common to get a history of recurring "bilious attacks," dating from childhood. One patient with migraine had had asthma previously, and there were several instances of the former, and occasionally of the latter in the patients' family histories.

ANXIETY

It is recognised that worry, due to loss of the sense of security, added responsibility or other such causes, predisposes to recurrence of attacks of indigestion and to the development of ulcer in susceptible persons. Cases have been reported of perforation or hæmatemesis following on an emotional upset (Davies 1935). In the present series, about one patient in five showed some evidence of anxiety in their tense expression, wrinkled brows or in other signs. Many were aerophagists (Allison and Thomas 1941). A series of 20 cases, in whom the history and findings were typical of ulcer, was selected for more detailed investigation of the personal history. The results of this inquiry are summarised in table IV under sections A and B.

Domestic life.—Undue anxiety connected with the domestic or home life was mentioned 9 times, and in 4 of the cases the worry was connected with illness of a near relative or child. Financial difficulties were the source of anxiety in 4 other men who were volunteers or conscripts, but this cause was rarely mentioned by the pensioners and reservists because most of them had their peace-time employment to return to at the end of the war, and their income had not been affected by being called up.

Service life.—In 6 men there was some difficulty in the performance of duties but only 2 found their work difficult because of lack of previous experience. One was a pensioner marine (case 1) who was working in a busy staff office after having been many years out of the service. The other (case 4), a thin anxious type, who volunteered for service at 39 because he was out of work, was stoking a trawler in the North Sea. He had never been in a ship before and suffered badly from seasickness. Seasickness played no important part in the cases as a whole, however, and only 2 men had been badly upset by actual war experiences. Repeated aerial bombing had made one man (case 17) jumpy, irritable and unable to concentrate, but lack of sleep was an important contributory factor.

Effect of worry on digestion.—Out of the 20 patients, 7 recognised a connexion between their dyspepsia and worry or anxiety. The following examples illustrate the nature of the association.

CASE 1.—Marine pensioner, aged 46. Long history of mild dyspepsia in peace-time. Hæmatemesis shortly after called up in August, 1939. Duodenal ulcer. Clerical duties in staff office. Dissatisfaction with work: "like a square peg in a round hole," always "underneath it." Sometimes feels "I want to get away and take something to buck me up, if only a couple of pints of beer, to put me on the level again." Indigestion daily. When exasperated gets "a gripping pain," "almost crucifying" in its intensity.

CASE 3.—Able seaman R.N., aged 26. Dyspepsia began at age 18. At 20, appendicectomy and free of symptoms for three years. Since then, until war, mild recurring attacks, only once in hospital in 1937. Since war, more severe pain with perforation of duodenal ulcer November, 1939. Sensitive to "nagging" and interference, and has often noticed "tingling" and gripping pain in the stomach when annoyed. "It would put me off my food and I would have two smokes instead. One would not be enough."

CASE 21.—Conscript, ord. seaman, aged 25. Recurring attacks of typical ulcer pain since age 16, but has kept fairly free in the past two years by dieting. A fisherman and unmarried, he was conscripted, together with a younger brother, in June, 1940, and sent to a training establishment. Free of pain at the time but found the food too rich and heavy and pain recurred. While proceeding on draft to join a ship some weeks later was taken suddenly ill with acute abdominal pain and perforated a duodenal ulcer. He was the eldest of a family of seven. He had always been over-conscientious with a strong sense of duty. He had never tried to evade responsibility but it had always worried him more than it should. On such occasions he would get aching pain in the stomach. His father died in May, 1940, a month before he was called up, and all the responsibility for settling his affairs devolved on him. He left home with these still unsettled and he was worried constantly about the fishing boats and gear. He hoped that he and his brother would be drafted to the same ship and only learnt to his intense

TABLE IV—PERSONAL HISTORY AND PERSONALITY IN 20 ULCER PATIENTS

Case	Rating	Age	A			B				C				Comments
			1	2	3	1	2	3	4	1	2	3	4	
1	Marine, pens.	46	+	−	−	+	−	−	−	+	−	−	+	Duod. ulcer. Hæm. Aug. 1939.
2	A.B., R.F.R.	36	+	−	−	−	−	−	−	+	−	−	−	Duod. ulcer.
3	A.B., A.S.	26	−	−	−	−	−	−	−	+	+	+	+	Duod. ulcer. Perf. Nov. 1939.
4	Stok., H.O. vol.	39	+	−	+	+	+	+	−	+	−	−	−	Gastric ulcer.
5	O.S., A.S.	24	−	−	−	−	−	−	−	−	−	−	−	Duod. ulcer.
6	P.O., A.S.	32	−	−	−	+	−	−	−	−	+	+	−	Duod. ulcer.
7	Sailmaker, A.S.	32	−	−	−	+	−	−	−	−	−	+	+	Duod. ulcer.
10	A.B., R.F.R.	37	−	−	−	−	−	−	−	−	−	−	−	Duod. ulcer.
11	A.B., R.F.R.	36	−	−	−	−	−	−	−	−	−	−	−	Duod. ulcer.
12	Stok., H.O. vol.	49				Answers unreliable								Poor type. Gastric ulcer.
13	Mne., H.O. vol.	40	−	−	+	−	−	−	−	+	−	−	−	Duod. ulcer.
15	A.B., R.F.R.	38	−	−	−	+	−	+	−	+	−	+	−	Duod. ulcer.
16	E.A., pens.	41	−	−	−	−	−	−	−	+	+	−	−	Duod. ulcer. Perf. 1926.
17	Ldg. sea., A.S.	32	−	−	−	+	−	+	+	+	−	+	+	Duod. ulcer. Perf. Jan. 1941.
21	Ord. sea., cons.	25	+	−	+	−	−	−	−	+	−	−	−	Duod. ulcer. Perf. June, 1940.
22	A.B., R.F.R.	34	−	−	−	−	+	−	−	−	−	−	−	Duod. ulcer. Migraine.
24	Marine cons.	23	−	+	+	−	−	−	−	+	−	−	−	Duod. ulcer.
25	Marine pens.	40	−	−	−	−	−	−	−	+	+	+	−	Gastric ulcer. Melæna, April, 1940.
26	Asst. std., H.O.	30	−	−	−	−	−	−	−	−	−	−	−	Duod. ulcer.
28	Signalman, A.S.	38	−	−	−	−	−	−	−	−	−	−	−	Gastric ulcer.
30	A.B., R.F.R.	39	−	−	−	−	+	−	−	+	−	−	−	Duod. ulcer. Migraine.

A. Domestic life. 1. Anxiety over illness of relative. 2. Unhappy marital relations. 3. Financial difficulties.

B. Service life. 1. Duties; lack of experience, special difficulties, extra responsibility, boredom or monotony. 2. Seasickness. 3. Lack of sleep. 4. Anxiety following actual war experiences.

C. Personality. 1. Overconscientiousness. 2. Ambition, frustration, resentment. 3. Adaptability, obsessive tendencies, intolerance of interference. 4. Swings of mood; depression; excessive work.

disappointment that this would not be so five hours before he perforated his duodenal ulcer.

While the majority of the patients in this series had no great domestic worries to contend with, and were thoroughly conversant with their duties, the same personality traits one sees among gastric patients in civil life were often encountered—overconscientiousness, sense of frustration, obsessional tendencies and swings of mood towards depression. The frequency of these characteristics as judged by the patients' replies to leading questions, and by their behaviour while under observation, is given in table IV, under C. It is admittedly difficult to assess such qualities fully and accurately, but it was evident, even on superficial examination, that abnormal trends had played a part in determining deep emotional disturbances in many cases. Phrases such as: "When I do a job I like to do it properly"; "I always think I can do better"; "I have to be absolutely sure a thing is right before I can let it go" expressed conscientiousness, and this often led a patient to undertake more work or responsibility than was reasonable. Anxiety and abnormal mental tension resulted with a fixed determination to see the job through. Meals were neglected, too much tobacco smoked, and pain temporarily silenced by alkaline powder. In other instances, if the patient were put to work he considered unfair, or unsuited to his experience, or if he were blamed, as he considered unjustly, a fixed sense of frustration or resentment developed.

CASE 3 was an example of this. Some years ago he had been keen and ambitious but this had been "killed" by what he considered unfair treatment. He suffered periods of depression and was waiting only for the day when his service would terminate. Periodic over-indulgence in alcohol was his reaction, and this, coupled with over-smoking, may have contributed to the development of ulcer.

Another example was that of a man who had married in 1932, but had seen little of his wife because his service had been spent abroad. He had "strong views" on many subjects, neither drank nor smoked, and rarely went ashore in foreign ports. In 1937, after foreign service leave, he was again drafted overseas and was given a job which he considered inferior to his position as a seaman petty officer—"It was not a seaman's job and I am a seaman." He felt he was wasting his time, and there was "a good deal of messing about" which to him was especially trying. Typical ulcer pain was noticed for the first time in March, 1939. It became worse in August, but he carried on for over a year and was not sent home after reporting sick until June, 1940.

It is difficult to resist the conclusion in this case, as in the other examples, that increased mental tension was a predisposing cause of indigestion and ulcer formation; 14 patients showed some or all of these features. In the remaining 6 no abnormal personality trends were observed.

SUMMARY AND CONCLUSIONS

One hundred naval ratings suffering from gastro-duodenal dyspepsia have been investigated with regard to possible ætiological factors.

In the first year of the war the most frequent sufferers appear to have been pensioners and reservists between the ages of thirty and forty. Many of them were serving in destroyers, minesweepers, trawlers and other small auxiliary craft.

Defective teeth and gross dental sepsis were rarely seen, alcoholic excess only occasionally, but hurry over meals and excessive smoking were common features.

Unsuitable food was the usual cause advanced for the recurrence of indigestion by patients who had been accustomed to diet themselves before the war. Their inability to eat the ordinary naval rations probably was the cause of vomiting and of any loss of weight or vitamin-C deficiency they showed.

A small proportion (10%) were the subjects of migraine and in some of these there was evidence of selective food intolerance or allergy.

Although undue anxiety of the simple reactive type was not uncommon, the majority denied all worry and were familiar with the conditions and duties of naval life. In contrast, abnormal personality trends were comparatively frequent, especially towards over-conscientiousness, a sense of frustration and swings of mood with depressive phases.

The general conclusions from these results are much the same as those of Willcox (1940), Payne and Newman (1940), Graham and Kerr (1941), who have investigated the problem in the Army. In sailors, peptic ulcer appears to be the only serious cause of dyspepsia in the present war. Though its occurrence is perhaps not so frequent as in the Army, there is the same lengthy history, and the same tendency to attribute the cause to unsuitable diet. But this experience strengthens the view that psychological factors also play a part in the development of symptoms. How early these influences operate, and whether they are primary or secondary, it is impossible to say, for most of the case-histories were too long to enable one to study the early stages. It was noticed, however, that many patients who had been dieting themselves on instructions received in civil life had had no preliminary investigation. It cannot be doubted that the restrictions imposed were of value to those who had ulcers, but there appear to have been some in whom they were unnecessary. In these patients a conditioned reflex may have been set into operation when they were recalled to the service and forced to abandon their peacetime dietary. Such an effect would make it difficult for them to eat ordinary food without

getting pain, and would react on them adversely by increasing the emotional tension.

Acknowledgments are due to Surgeon Rear-Admiral F. J. Gowans, C.B., for permission to publish the results of the investigation of cases under his care. I am also indebted to Surgeon Lieut.-Commander D. M. Dean, R.N.V.R., for his help in compiling some of the case-notes.

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INFLUENCE OF ŒSTROGENS ON EXPERIMENTAL CANINE DIABETES MELLITUS

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THE evidence at present available suggests that treatment of an animal with relatively large doses of œstrogen inhibits the liberation from the anterior pituitary gland of certain of its specific hormones. Thus there is reason to believe that the secretion of the pituitary substances concerned with the growth of ovarian follicles, with lactation and with general somatic growth (see Van Dyke 1939 for references) is inhibited under the influence of large doses of œstrogen.

As the brilliant researches of Houssay and his school have shown, removal of the pituitary gland, or of its anterior part alone, results in a remarkable alleviation of the intensity of the diabetes produced by extirpation of the pancreas. It therefore seemed reasonable to expect that the intensity of the diabetic condition of depancreatised animals would be diminished by treatment with œstrogen, and such was found to be the case by Barnes, Regan and Nelson (1933) for the dog, and by Nelson and Overholser (1934, 1936) for the rhesus monkey.

On this experimental basis an extensive series of investigations has developed, indicating that treatment with large doses of œstrogen temporarily alleviates the diabetic condition which may develop in women during or after the menopause, and which may well be due to hyperactivity of the anterior pituitary lobe (see Gessler, Halsted and Stetson 1939, Spiegelman 1940, Cantilo 1941, for recent results and references to earlier investigations).

The recent accessibility of the relatively cheap synthetic œstrogen diethylstilbœstrol (Dodds, Goldberg, Lawson and Robinson 1939) has made an investigation of its influence on diabetes particularly desirable. Moreover, treatment with œstrogen can induce hyperplasia of the pancreatic islets in normal animals (Cramer and Horning 1936), an increase in pancreatic-insulin content (Griffiths and Young 1940, Griffiths, Marks and Young 1941) and histological evidence of excessive secretory activity of the islet cells (Vazquez-Lopez 1940). It was therefore conceivable that treatment with œstrogen of dogs made permanently diabetic by a short course of injections of anterior pituitary extract (Young 1937) might result in some repair of the damaged pancreatic islets observed in these animals (Richardson and Young 1938, Richardson 1940), which are presumably not incapable of some degree of regeneration. Such regeneration should show itself in a relatively long-lasting alleviation of the diabetic condition.

When, as will be seen, negative results were obtained in the present experiments on the influence of diethylstilbœstrol on the condition of the pituitary-diabetic dog (cf. Lawrence and Madders 1941), similar investigations were carried out with crystalline œstrone and œstriol.

Animals.—Experiments were carried out with four pituitary-diabetic dogs, one female and three males, and with one male depancreatised dog. In all except one of the experiments with pituitary-diabetic dogs the animals received no insulin, and under such conditions corrected D/N quotients of over 3 were consistently observed during periods when the dogs received a diet of meat only (Young 1938, Marks and Young 1939).

With the pituitary-diabetic dogs the experimental method was similar to that adopted in previous investigations. The dogs were maintained on a diet of horse-flesh, of which they were allowed and encouraged to eat as much as they would, and daily records were kept of the amount of food eaten, and of the amount of sugar, nitrogen and ketone excreted in the urine. In the calculation of the corrected urinary D/N quotient the gross sugar excretion was corrected for the small amounts of preformed carbohydrate in the meat consumed.

During the course of one experiment, pituitary-diabetic dog 116 received daily subcutaneous injections of 10 units of protamine zinc insulin but, as in earlier experiments on the same animal and in those with other pituitary-diabetic dogs, this animal was permitted to consume meat to repletion during this period.

With the depancreatised dog, the procedure was necessarily different because of the lack of pancreatic enzymes. This animal was maintained on the mixture of raw meat, raw pancreas and glucose described by Campbell and Best (1938), together with adequate insulin therapy. Under these conditions a large proportion of the ingested meat is absorbed. For assessing the influence of œstrone on the intensity of the diabetic condition, the proportion of the total available dietary carbohydrate retained was calculated in the manner described by Marks and Young (1939).

Administration of œstrogens.—Since the technique of implanting tablets of solid material under the skin (Deanesly and Parkes 1937) has obvious advantages over the daily administration by subcutaneous injection of a solution of the material, the former method was first tried. When, however, negative results were obtained with this technique subcutaneous injections of a solution of the œstrogen in nut-oil were given daily for five days.

Chemical estimations.—Urinary nitrogen was determined by Kjeldahl's method, and urinary sugar by that of Benedict. Urinary ketone, expressed as total acetone, was estimated by the Van Slyke modification of the Deniges method, or, when the amount present was very small, by an approximate colorimetric method.

As will be seen from tables I and II, no influence of œstrogens on the intensity of diabetes in the pituitary-diabetic dog, or on that of the insulin-treated depancreatised dog, was observed in these experiments. Although the data are not given in the tables, it was also found that treatment with œstrogens did not influence the body-weight of these animals, which in all instances was approximately steady.

DISCUSSION

The negative results obtained in this investigation of the putative antidiabetic action of œstrogens are surprising but nevertheless clear-cut, and the discrepancy between these and the earlier experimental results of Barnes, Regan and Nelson (1933) and of Nelson and Overholser (1934, 1936) are difficult to explain. The doses of œstrogen used in the present investigations are much greater than those used by the earlier workers, but treatment with such big doses would reasonably be expected to give a more effective suppression of pituitary function. In any case clinical investigations have demonstrated the necessity of using relatively enormous doses (cf. Cantilo 1941) in order to demonstrate the antidiabetic effectiveness of œstrogens in postmenopausal diabetes, but even so, Lawrence and Madders (1941) have observed negative results with large doses of diethylstilbœstrol.

The pituitary-diabetic dog receiving an unlimited diet of meat was observed by Marks and Young (1939) to respond to the administration of a small dose of insulin by a striking diminution in ketonuria, even though the D/N quotient might be only slightly affected. This is borne out by the data for the various control periods for dog 116 in table I of the present paper, which illustrate the effect of giving 10 units of protamine zinc insulin to this animal. The administration of diethylstilbœstrol, on the other hand, had no effect, on the average, on the ketonuria of the pituitary-diabetic dogs, while œstrone tended to increase it (table I). It is possible that the administration of œstriol to dog 115 resulted in a significant *rise* in the D/N quotient, although the result of this single experiment cannot be taken as conclusive.

TABLE I—EFFECT OF TREATMENT WITH ŒSTROGENS ON INTENSITY OF DIABETES IN PITUITARY-DIABETIC DOG
Data are average values for the various periods

No. and sex of animal	Treatment	Control period (7 days)				Period of treatment				Period after treatment (7 days)		
		Glycosuria (g./day)	Corrected D/N	Ketonuria (g./day)	Length of period (days)	Total œstrogen absorbed (mg.) (approx.)	Glycosuria (g./day)	Corrected D/N	Ketonuria (g./day)	Glycosuria (g./day)	Corrected D/N	Ketonuria (g./day)
	(a) Diethylstilbœstrol											
112 M.	Three 15 mg. tablets subcutaneously	162	3·25	0·44	7	85	169	3·54	0·70	141	3·45	0·46
112 M.	Twenty 15 mg. tablets subcutaneously	139	3·31	0·76	7	50	118	3·24	0·65	124	3·55	0·43
116 M.		55	3·47	1·01	7	50	58	3·11	0·75	56	3·26	0·57
115 F.	10 mg. subcutaneously in oil daily	69	3·34	0·02	5	50	70	3·12	0·02	63	3·13	0·08
116* M.		87	2·41	0·05	5	50	77	2·81	0·07	90	2·99	0·16
	Average	*102*	*3·16*	*0·46*	..	..	*98*	*3·16*	*0·44*	*95*	*3·28*	*0·34*
	(b) Œstrone											
111 M.	Seven 10 mg. tablets subcutaneously	88	3·30	3·20	7	2·1	122	3·32	3·80	104	3·32	2·92
112 M.	5 mg. subcutaneously in oil daily	104	3·49	0·44	5	25	86	3·26	1·33	97	3·26	0·34
116 M.	10 mg. subcutaneously in oil daily	44	2·88	1·01	5	50	20	2·89	1·49	49	3·40	0·76
	Average	*79*	*3·22*	*1·55*	..	..	*76*	*3·16*	*2·21*	*83*	*3·33*	*1·34*
	(c) Œstriol											
115 F.	10 mg. subcutaneously in oil daily	90	2·82	0·13	5	50	57	3·07	0·15	49	3·45	0·10

* Given 10 units protamine zinc insulin daily.

Janes and Nelson (1940) found that rats which were treated daily with diethylstilbœstrol contained more glycogen than control animals, possibly indicating a stimulation of glyconeogenesis by this œstrogen. That the formation of glycogen can be stimulated during fasting by œstrogens appears certain from the results of Griffiths, Marks and Young (1941), although the source of the new carbohydrate is not clear. If such stimulation of gluconeogenesis occurs when the diabetic animal is treated with œstrogens a rise of D/N quotient would not be expected unless some part of the newly formed

TABLE II—INFLUENCE OF TREATMENT WITH DIETHYLSTILBŒSTROL ON CARBOHYDRATE RETAINED BY INSULIN-TREATED DEPANCREATISED DOG

(Dog 108, male, receiving 40 units insulin per day)

Treatment	Control period (7 days)			Period of treatment (7 days)		Period after treatment (7 days)	
	Glycosuria (g./day)	Carbohydrate retained (%)*	Total amount absorbed (mg.) (approx.)	Glycosuria (g./day)	Carbohydrate retained (%)*	Glycosuria (g./day)	Carbohydrate retained (%)*
Two 15 mg. tablets subcutaneously	28	73	5	32	68	26	70
Twenty 15 mg. tablets subcutaneously	29	72	50	40	61	36	66

* Percentage of total available.

sugar came from fat, but of this there is no clear evidence in the present experiments.

Although œstrogens can increase the amount of pancreatic tissue in the intact mouse or rat, the negative results of the present investigation do not support the idea that any regeneration has occurred of the damaged islets of the pituitary-diabetic dog.

SUMMARY

The administration of large doses of pure œstrogen (œstrone, œstriol and diethylstilbœstrol) to 4 pituitary-diabetic and 1 depancreatised dog was found to exert no obvious antidiabetic action. In fact, with œstrone and œstriol the effect was pro- rather than anti-diabetic.

The reasons for the differences between these results and those of other investigators, who have successfully treated with œstrogens both experimental pancreatic diabetes in the dog and postmenopausal diabetes mellitus in women, are discussed.

I wish to express my gratitude to Messrs. Parke Davis & Co., Organon Laboratories, and Messrs. Boots for gifts of œstriol, œstrone and diethylstilbœstrol respectively.

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HUMAN DIABETES TREATED WITH ŒSTROGENS

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THE attempt to treat diabetes with œstrogenic substances seems a logical outcome of experimental facts concerning the relation of the pituitary to carbohydrate metabolism. It is known (1) that saline extracts of the anterior pituitary can produce diabetes, at least in dogs (Young); (2) that the decrease of œstrogens at the menopause is accompanied by an increase in pituitary activity, which can be checked by œstrogen injections; and (3) that there is a particularly high incidence of diabetes in women at the menopause which it is tempting

to ascribe to increased pituitary activity. Both in animals and man diabetes has already been treated by œstrogens and variable results claimed. In 1939 Gessler and others (who review the literature) injected 50,000 international units of œstradial-benzoate daily into five diabetic women and claimed improvement in three and relapse after stopping the injections; doses of 20,000 I.U. gave no results. Spiegelman (1940) claimed that 10,000 I.U. injected twice a week reduced the insulin requirement of nine diabetic women by some 40% and that omission of injections was followed by increased insulin need. Cantilo (1941) has just published results in forty diabetic menopausal women and claims that

RESULTS OF TREATING FIVE FEMALE DIABETICS WITH 4 MG. OF STILBŒSTROL DAILY FOR 8 WEEKS

Case	Age (yr.)	Stilbœstrol				Results
		Before		During and after*		
		Insulin (units)	Blood-sugar (mg. %)	Insulin (units)	Blood-sugar (mg. %)	
1	51	16	203	16	169	Slightly better
2	48	30	273	42 *54*	400 *285*	Worse, needed more insulin
3	52	22	192	22	213	No change
4	42	48	206	48 *56*	218 *184*	No change
5	52	26	270	26	155	Better, but anorexia from heart failure

* Dosage and blood-sugar determinations after the course of treatment are in italics.

œstrin and progesterone have been successful in every case in controlling the diabetic state, but the details he records are so scanty and his sugar-tolerance tests so impossible that this paper must be neglected as serious evidence. Any clear improvement has been temporary and obtained by injections, so that there is no obvious advantage over insulin. Now, however, synthetic stilbœstrol is available, orally active and cheap, and it is important to see whether it can help in the treatment of diabetes.

Early in 1939 it was planned at King's College Hospital to try the effect of stilbœstrol on fifty outpatient diabetic women of menopausal age. The experiment had been completed on only five before the war dispersed many of our patients and made careful and standardised observations on most impossible. Recently we discovered that Young had made similar studies on his pituitary-diabetic dogs and both observations, although few in number, are so uniformly negative as to warrant confidence in publication. They at least establish the failure of œstrogens (stilbœstrol) in diabetes.

The effects on the five women are shown in the table. All were treated as outpatients, but their diet, conditions of life and insulin dosage were reasonably stable and closely observed before and during treatment. For 8 weeks they were given 1 mg. of stilbœstrol by mouth four times a day, sufficient to ensure a continuous action without toxic effects. Changes in the diabetic condition were judged by general health, by urine tests for sugar and ketones and by blood-sugar estimations carried out in a constant time-relation to food and insulin. Some cases showed slight changes, for better or worse, but not outside the minor variations always occurring in diabetes.

We conclude that the dosage given had no demonstrable effect on the diabetic condition.

SUMMARY

Five women diabetics of menopausal age were given 1 mg. of stilbœstrol four times daily for 8 weeks. The changes noted were not greater than the normal variations in diabetics.

We wish to thank Messrs. Boots for their gift of stilbœstrol.

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Reviews of Books

Surgery of Modern Warfare

Part IV. Edited by HAMILTON BAILEY, F.R.C.S. Edinburgh: E. and S. Livingstone. Pp. 481–640. 12*s.* 6*d.*

THIS volume contains accounts of wounds of bone and joints, plastic surgery and injury to the eye. Mr. Hamilton Bailey defends the contradictions to which reviewers of previous volumes have drawn attention; they have not, he maintains, crept in by mistake but are expressions of differences of opinion. Such divergencies are admittedly stimulating and tend to keep our ideas fluid, but contradictory advice on identical problems is out of place in a book which seeks to be authoritative. For instance, in the first of the two chapters on amputations the author maintains that the surgeon must be given a free hand in determining the site for amputation and that the instrument maker must do the best he can with the stump provided; in the second, this advice is flatly contradicted and close collaboration between surgeon and limb fitter is advised so that the amputation is performed at a site satisfactory for the fitting of a prosthesis. Surgeons with special experience of amputations will endorse the latter view but they will not require instruction on this problem. What of the surgeon with some experience of general surgery but without special experience of war-time surgery, for whom, we are told, this book is written? After reading these accounts his ideas may still be fluid, but it is a fluidity in which he is left to sink or swim without a life-line. In the section on bones and joints there is a valuable discussion on amputation in cases of compound fracture. Here the indications are clearly set out and a table is included showing why amputation is so commonly considered in fractures of the lower limb and so rarely necessary in fractures of the arm. Exception might be taken to the statement that in excision of the elbow "the ulnar nerve is dissected carefully and retracted out of harm's way." In this operation (which is performed subperiosteally) the ulnar nerve should not be seen. There can be no quarrel with the statement that "to apply a hip spica properly requires as much training and experience as to perform a gastrojejunostomy correctly." A plea is entered for brachial-plexus block to avoid shock in operations on the arm, and injection of 10 c.cm. of 1% Novocain is advised. If a satisfactory block can be obtained with this small amount of solution no doubt this type of anæsthesia is suitable for controlling shock. On the other hand, the method is not to be recommended unless the surgeon has special experience of it; in most hands at least 30–40 c.cm. of 1% novocain are required to give perfect anæsthesia, and injection of this quantity often causes a fall in blood-pressure.

There is an excellent account of sequestrectomy and the methods of dealing with chronic bone infection. Wounds of the face are discussed clearly and authoritatively, and the success of this chapter is largely due to the fact that the whole of a reasonably wide field has been entrusted to a single authority. The section dealing with the eye will prove of great value to those general surgeons who are of necessity exploring a little known realm for the first time.

Thorpe's Dictionary of Applied Chemistry

(4th ed.) Vol. IV: *Digallic acid—Feeding stuffs.* By JOCELYN FIELD THORPE, Kt., D.Sc., F.R.S., F.I.C. and M. A. WHITELEY, D.Sc., F.I.C. London: Longmans, Green and Co. Pp. 603. 70*s.*

THE fourth volume of the new edition of "Thorpe" continues the stately march forward of the previous three, and is of the same high standard. It is to be hoped that the sad loss of Sir Jocelyn Thorpe will not retard the appearance of the next volumes. There are revised articles on emetine, ephedrine, ergosterol and ergot of rye and 17 pages deal with disinfectants from the widest aspect. The longest articles, which rank as monographs, are on dyeing, azo-dyestuffs and explosives; the last, and those on ensilage and feeding-stuffs match our times. There is a short, sound and practical account of ethyl ether by Mr. A. J. Ewins. It is a pity that the great subject of enzymes has to be dismissed in five pages.

THE LANCET

LONDON: SATURDAY, MAY 10, 1941

THE SHORTAGE OF DOCTORS

THE announcement that the American Red Cross have been asked to send us a thousand doctors for the Services and the E.M.S. seems to have surprised some medical men and women in this country. It has perhaps not been fully realised outside Government departments and the medical war committees who are acting as their agents that the flow of new entrants to the profession, balanced by the inevitable losses through age, sickness and death, is insufficient for the needs of the expanding Armed Forces, the greatly developed civil hospitals in which the E.M.S. is incorporated, civil defence, and the medical care of the civilian population, especially in the areas to which large sections of town people have been transferred. War spells waste in medicine as in any other field of human activity. It may seem absurd that the removal from civilian life of a moderate proportion of men and women at a stage of life when sickness and mortality are comparatively light should necessitate the transfer to the Forces of a much higher proportion of the available medical men and women. But when a country takes its young men and women into services which expose them to special dangers it must make special provision for their care. The Navy, Army and Air Force must have medical staffs familiar with their ways and sufficient in numbers and ability to meet the emergencies which can be reasonably foreseen, to train their lay assistants, and to be responsible for preserving and promoting the health of their units as well as treating the illnesses or accidents which arise from day to day. In times of stress, too, the mere presence of a medical officer helps to maintain morale. For all these reasons it is not possible to compare strictly the proportion of medical practitioners to lay personnel required in the Services with that which is adequate in civil life, and medical practitioners joining the Forces cannot expect to be fully occupied all the time in the same pursuits as in peacetime practice.

The complaint is sometimes heard from doctors that they have offered themselves to the Services or the E.M.S. without response. There are indeed strange instances of this anomaly. Men born in this country of parents who were nationals of lands now overrun by Germany have been rejected for no other obvious reason and the Services seem to have been reluctant to employ friendly aliens though they appeared to be competent, loyal and proficient in the English language. In some such cases there may have been incommunicable justifications, but there is ground for the suspicion that Service departments have been playing for safety to an extent which is not permissible in these hard times. Medical men and women with special training and experience have expressed disappointment that no place has been found for them in the national effort, but it has to be remembered that special places are limited and are not found quickly. Elderly practitioners have also wished to serve within the limitations of their capacity and inclinations which are not easy to meet in such a time of upheaval. The essence of the situation is that young doctors with some hospital experience are most in demand for the three Services and the E.M.S. and that the shortage is particularly in this age-group. So far it has been partially overcome by taking more of the older men away from practice than can safely be spared. Only to a small extent has relief been found by using senior medical students as house-officers, as the Ministry of Health has now rather tardily suggested, an expedient which might improve medical education if it were wisely effected. The E.M.S. and the civil hospitals generally, which have had great difficulty in coping with the actual potential increase in the strain of war-time on their personal resources, must adjust themselves to conditions far short of the ideal and perhaps work at a lower level of efficiency.

The position would be eased if the demands of the Services could be reduced. There is evidence that they are not always using their medical personnel to the best advantage, that overlapping might be saved by combining the three medical services in one area, and that more use could be made of local practitioners and the staffs of existing emergency hospitals to release Army doctors now held in readiness for emergencies. It seems doubtful, also, whether it is necessary to retain every medical man who has been trained in an ambulance unit until that unit is sent abroad or called into action at home. These questions require closer and more continuous attention than the Robinson Committee was able to give them during its short session, though its recommendations[1] seem eminently sound, more especially the last, which urged the establishment of "an effective organisation for the settlement of questions of priority." Whatever the answers may be, the aid from America will certainly be needed and most cordially welcomed, but it is our duty to see that these keen young men who cross the Atlantic are protected from the dissatisfaction and boredom which has been repeatedly expressed not only by our own practitioners but also by those who have already joined us from the Dominions. Not long ago the Prime Minister, to whom we appealed in our leading article of March 1, said that the Armed Forces generally might have to "comb their tails." It will be no easy task for the medical branches of the Services to reorganise themselves at the same time as they have to meet increasing demands by the fighting establishments, but they must promptly face the problem or seek the assistance of others who can take some of the burden off their shoulders.

PITUITARY EXTRACT IN OBSTETRICS

PITUITARY extract is a powerful weapon which handled incautiously in labour may prove a danger to mother and child. When first introduced into obstetrics its strong stimulant action on the parturient uterus won it a ready popularity. The pioneers—BLAIR BELL, DE LEE and HOFBAUER—were careful to stress its indications and limitations, but later enthusiasts were soon using it in doses and conditions that would have shocked them. Disaster followed: for the mother, uterine tetany and rupture;

1. Given by Mr. Ernest Brown in answer to a question in Parliament. See THE LANCET, May 3, 1941, p. 587.

for the baby, intracranial damage and asphyxia. Appreciation of these dangers led the cautious and conservative to condemn its use in obstetrics altogether, but others still employ the drug to hasten the process of delivery in the first and second stages of a normal labour. The extreme attitudes whether of acclamation or condemnation are indefensible and bring pituitary extract into unfair dispute. In order to clarify the position—it is hoped for all time—the section of obstetrics and gynæcology of the American Medical Association have made it the subject of a symposium.[1]

Even in these enlightened days of exact assay, there are on the market a number of pituitary extracts which may vary in the strength of their action on the uterus. Individual idiosyncrasy is not unknown and uterine tetany has been reported after doses as small as one unit. Most preparations are capable of inducing side-effects apart from a purely oxytocic action, and these include pressor and antidiuretic action and anaphylaxis; the loose term pituitary shock shows that we are aware of these unwelcome results. Moreover it is believed that the action of pituitary extract may be cumulative and that a small original dose may sensitise the uterus to respond abnormally to the same amount given later. The action of the drug has of late been widely studied in vivo by means of the tocodynamometer, an instrument that records graphically the behaviour of the uterus in labour. Even small doses prolong uterine systole, shorten diastole and induce a state of minor tetany. This increase of muscular tone may produce a placental ischæmia so effectively as to jeopardise the proper oxygenation of the fœtus, thereby causing intrauterine distress and even death. At best the violence of the contraction results in a rapid moulding of the fœtal presenting part, with the consequent risk of intracranial damage. Such damage may not necessarily result in stillbirth, but it is a potent cause of neonatal ill health and permanent damage to the child's brain. Nor must the maternal aspect be forgotten: apart from the grosser lesions of uterine and cervical rupture there is the damage to the muscular, fascial and ligamentous supports of the uterus, with all the evil sequelæ of prolapse and pelvic ill health in years to come. These are some of the dangers of what DE LEE picturesquely calls "a stream-lined labour."

There are, however, certain well-tried scientific indications for the use of pituitary extract in obstetrics. First, in the abortions of early pregnancy to avoid or assist surgical evacuation of the uterus; secondly, in the medical induction of labour, with castor oil and sometimes quinine, provided that only small (1 unit) doses are used at 30 minute intervals up to a maximum of 10 units and that the drug is stopped immediately the uterus responds; thirdly, in uncomplicated cases of primary uterine inertia—that is, where there is no disproportion or malpresentation; fourthly, in certain cases of abruptio placentæ or atonic antepartum hæmorrhage, again in small carefully observed doses; and fifthly, in atonic postpartum bleeding, where it may be given in larger doses, intravenously or directly into the uterine muscle. Comparable to this last is its use in cæsarean section after delivery of the child and placenta. Apart from these well-defined and properly defensible indications pituitary extract should never be employed in obstetric practice; above all it must on no account be used to hasten the processes of normal labour in the first and second stages. As a prophylactic after delivery of the placenta a dose of ergot extract or an ergometrine tablet by mouth has a more prolonged effect than a pituitary injection, is cheaper and avoids the risk of "pituitary shock."

1. Sharkey, J. A. *J. Amer. med. Ass.* Oct. 19 1940, p. 1315; Pendleton, G. F. *Ibid*, p. 1318; de Lee, J. B. *Ibid*, p. 1320.

WHERE TOBACCO MOSAIC HAS LED US

MUCH of the remarkable advance made in the last few years in our knowledge of the viruses has been due to the stimulus of W. M. STANLEY'S work on the virus of tobacco mosaic, which he was the first to show could be obtained as a crystalline protein material. This finding, although strongly criticised by many, has been upheld by later work and has in fact encouraged the investigation of virus problems by specialists in all fields of study. Its importance has lately been recognised by the presentation of the gold medal of the American Institute of New York to Dr. STANLEY. Viruses in general had long been considered to be living organisms, albeit of a specialised type, and the identification of a virus as a protein, or as was shown by BAWDEN and PIRIE[1] a nucleoprotein, prompted the immediate criticism that the protein was merely an impurity carrying the actual virus. This contention has so far received no support from later work, no separation of the characteristic nucleoprotein and the virus activity having yet been achieved by chemical or physical methods. Ultracentrifugal and electrophoretic analyses have indicated that the material is homogeneous, but solubility studies now show that such preparations may contain fractions of varying solubility but which all possess the same infectivity. The suggestion has accordingly been made that the virus is better described as a family of closely related substances rather than as one individual. This point of view receives some support from variations in the virus which have been noticed in other work, for mutant strains have been isolated from plants inoculated with a single infectious unit of the ordinary strain. More noticeable differences have been found in the nucleoproteins isolated from plants infected with different strains of the virus, which although showing very similar properties yet show slight characteristic differences. It is probable that these differences lie chiefly in the protein component, for the nucleoproteins giving rise to tobacco mosaic, latent mosaic and tobacco ring spot give very similar nucleic acid absorption spectra, but the spectra for the protein components are different and characteristic for each virus. Following shortly upon STANLEY'S original isolation of the tobacco mosaic virus and the isolations by the English workers, X-ray studies were published by BERNAL and FANKUCHEN[2] which showed that Stanley's crystals should more strictly be termed "para-crystals," as they were apparently made up of units with a diameter of 15 mμ and a length exceeding 150 mμ and packed longitudinally with regularity in two dimensions only. This finding, however, in no way vitiates the idea of a crystalline

1. Bawden, F. C., Pirie, N. W., Bernal, J. D. and Fankuchen, I. *Nature, Lond.* 1936, **138**, 1051.
2. Bernal, J. D. and Fankuchen, I. *Ibid*, 1937, **139**, 923.

virus, for another plant virus giving rise to the condition bushy stunt has been obtained in true rhombic crystals.[3] The estimated dimensions of the units of the tobacco mosaic virus have recently been substantiated in a remarkable manner by the use of the electron microscope and these results are summarised by STANLEY in his address.[4] That the virus units are rod-shaped has been confirmed and their dimensions have been measured and found to be about 18 mμ in diameter and about 280 mμ in length; the ability of the virus units to aggregate themselves end to end in long chains has also been confirmed.

Although it has been possible for some time to follow variations of a virus in the laboratory, it is only recently that it has appeared possible to initiate changes experimentally. The results of Ross and STANLEY[5] showed that the activity of the tobacco mosaic virus could be suppressed by masking the amino-groups of the protein by treatment with formaldehyde and that the process could be reversed with a recovery of the virus activity. The modified virus still possessed serological activity although no longer capable of producing the disease. These investigations are being continued, and STANLEY makes the suggestion that as our knowledge of the architecture of viruses increases it may become possible to produce in the laboratory new or useful forms of viruses which may have fundamental medical importance. He goes on to discuss the possible initiation of pathological conditions by the mutation of a masked or latent virus or by changes in the host cell which become favourable to the virus. The dependence of virus growth on the state of cell nutrition is well shown by the work of SPENCER[6] on the production of tobacco mosaic virus in plants receiving different amounts of nitrogen and on the effect of nutrition on their susceptibility to infection. The ability of viruses to enter into the metabolic changes within the cell has attracted many workers to the idea of a direct relationship between virus activity and malignant changes, although the mechanism of the inception is still obscure. It is by no means evident that all the entities covered by the name virus will submit to investigation as readily as the plant viruses—indeed differing degrees of complexity appear possible. For example, it has not yet been found possible to obtain vaccinia virus or Rous sarcoma virus entirely free from fatty material,[7] and enzyme activity has been found associated with the former virus.[8] If these differences are real they merely serve to emphasise the gradual increase in complexity and function as one passes up the series from the simpler proteins to the enzymes, the plant viruses and the animal viruses, and from them to the smaller of the more generally accepted organisms. STANLEY concludes that the property of life is inherent in all matter.

Dr. G. L. GULLAND, who died in Edinburgh on May 4 at the age of 79, was one of the big clinicians of his time. He held the chair of medicine in the university and became president of the Royal College of Physicians of Edinburgh, while spending his life in the service of the Royal Infirmary.

3. Bawden and Pirie, *Brit. J. exp. Path.* 1938, **19**, 251.
4. *Science*, Feb. 14, 1941, p. 145.
5. Ross, A. F. and Stanley, W. M. *Proc. Soc. exp. Biol. N.Y.* 1938, **38**, 260; *J. gen. Physiol.* 1938, **22**, 165.
6. Spencer, E. L. *Plant Physiol.* 1939, **14**, 769.
7. Pollard, A. *Brit. J. exp. Path.* 1939, **20**, 429.
8. McFarlane, A. S. and Salaman, M. H. *Ibid*, 1938, **19**, 184.

Annotations

GASTRIC ACIDITY IN INFANCY

IN the innumerable studies of gastric secretion made in the last twenty years the first month of life seems to have escaped attention. This gap has now been filled by R. A. Miller[1] of Edinburgh. In 50 healthy mature breast-fed infants the fasting juice was withdrawn seven hours after a feed for the first ten days of life. In addition, to obtain figures for the eleventh to thirteenth day, fasting juice was taken from any healthy infant in this age-period who was detained in hospital. Expressed as N/10 HCl per 100 c.cm. of stomach contents the average total acidity was nearly 40 c.cm. on the first day of life; thereafter it fell to only just over 11 c.cm. by the tenth day, and then rose steadily to about 18 c.cm. by the end of the month. There was at first great variation between the maximum and minimum amounts of free acid, but after the seventh day the free acid fell to zero in most of the infants. The maximum acidity in the fasting juice, reached within 48 hours of birth, averaged in the 50 infants 21·6 c.cm. N/10 HCl for free acid and 45·9 c.cm. for total acid. As Miller points out, this is astonishingly high, for it is equivalent to that of a healthy adult, and is not again reached in childhood until the age of three years. To explain the high acidity in the first few days Miller suggests that some gastrogenic hormone reaches the infant either from the mother or the placenta, and that the influence of this secretogogue vanishes, leaving the infant to control its own gastric digestion, by the tenth day of life. It would have been useful to compare the figures for infants with those of their mothers at the time of delivery, but practical considerations ruled this out. There is, however, evidence that the mother's gastric acidity, low during pregnancy, rises towards the normal adult figure as delivery approaches, and Miller concludes that the infant's gastric acidity at birth may bear a close similarity to that of the mother. Such a relationship is also suggested by his finding of achlorhydria in 6 of the 50 newborn babies, for other workers found this deficiency in 3 out of 24 mothers, an almost identical proportion. The fact that achlorhydria was found in these infants may make others besides pædiatricians revise their ideas, for most investigators have declared that free acid is always present in the fasting juice of the unfed infant at birth, and have denied the existence of congenital anacidity. Histological examination by Miller of the stomachs of 10 infants who had died within 8 days of birth showed that the heavier a baby is at birth the better is its gastric mucosa developed, but there was one exception, a mature infant in which the mucosa was hypoplastic. Whether such persistent hypoplasia ever produces a congenital achlorhydria cannot be decided, as Miller says, without further investigation. If it does, the atrophic gastritis demonstrable in adults with achlorhydria may sometimes be a sequel of this condition.

HOSPITALS IN AIR-RAIDS

IT is perhaps natural that a good deal of publicity is given to bombs falling on hospitals, but its effect may well be to give a distorted view of the risks run by the inmates, staff and patients, and lead to a reluctance on the part of the latter to enter them for necessary treatment. Most hospitals are large buildings occupying much space, and with indiscriminate night bombing it is inevitable that they will receive a share of the attack. From the point of view of relative risks the moot point is whether they in fact receive more than their fair share, or, if they do not, whether they are more susceptible to their fair share than other buildings. With really indiscriminate bombing it would be inconceivable for them to receive an undue proportion of bombs (except by an

1. *Arch. Dis. Childh.* March, 1941, p. 22.

unfortunate play of chance); with an aimed attack their risks would be enhanced by their proximity to industrial targets, by enemy pilots mistaking them for such, or by deliberate attacks on them. Many of them being old buildings they might react unfavourably to the bombs they received. The Minister of Health has recently answered both questions in the negative. Hospitals, he said, run no more risk of damage than other buildings and the damage they have incurred has in the main been slight. Indeed he goes further in concluding that the elaborate precautions taken to meet the conditions of heavy raiding have made the risk inside the hospitals less than those outside. To measure the risks of a particular community must be difficult and the Minister's figures lack the comparison with what the statistician calls control groups. For instance, of the staffs of the 400 London hospitals 3 doctors have been killed and 8 injured; 40 of the 5000 nurses have been killed and 124 injured; 15 porters and other lay staff have been killed and 76 injured. The figures for nurses are the most useful for only with them is the population at risk given. Their death-rate since September has, on this basis, been 8 per 1000 and their casualty-rate, fatal and non-fatal, 33 per 1000. How do those figures compare with the rates for the general population? There is no yardstick by which the assessment can be made. Similarly, taking the receiving hospitals in Greater London, 115 patients have been killed since last September, during which time over 80,000 sick and injured people have passed through them. Here we cannot calculate a death-rate, for this turns on the average duration of the patient's stay in hospital; but on the whole the figures seem reassuring and to substantiate the Minister's claim that the risks have not been unduly large and should not deter people from seeking medical attention. Clearly the desideratum is treatment outside heavily attacked areas, and a senior officer of the E.M.S. added a welcome rider to Mr. Brown's statement when he said that since September 80,000 ordinary sick patients have been transferred from London hospitals to hospitals outside.

POSITIVE SYPHILITIC TESTS IN HEALTHY PEOPLE

WITH most diagnostic serological tests there is no sharp line between normal and abnormal results. In practice the result is regarded as positive if it exceeds an arbitrary level which really represents a compromise between the antagonistic demands of specificity on the one hand and sensitivity on the other. The higher that arbitrary level is fixed the less likely it is that any sera other than those of patients suffering from the particular disease in question will give a positive result, so that the test becomes more specific; but as the level is raised an increasing proportion of patients with that disease may fail to give a positive result, so that the test becomes less sensitive. It follows that absolute certainty in diagnosis cannot usually be attained by such tests, though often it is possible to achieve a sufficiently high degree of probability to make them of great practical value. These considerations probably apply to serological tests for syphilis, but in this case the arbitrary level has been fixed by variations in technique instead of being expressed quantitatively. Sachs[1] reminds us that in the early days of the Wassermann reaction positive results were not uncommonly recorded in non-syphilitic persons, and although by modification in technique the tests have since been made more specific, so that now they are among the most reliable of laboratory investigations, it seems not unreasonable to suppose that a very small proportion of healthy people may still give positive results. This is perhaps all the more likely because various kinds of healthy animals, particularly cows, are known often to give positive reactions.[2] It is extremely difficult to find out what the proportion is because it is certainly so small that very large numbers of healthy people would have to be investigated, and also because there must always be the possibility of latent syphilitic infection in any who give positive reactions. These difficulties are acknowledged by Eagle,[3] who reports the results of such an investigation. Serological tests were performed on 40,545 college students in a number of different laboratories in America, apparently by various techniques which are stated to represent a fair cross-section of current serological practice in the country at large. Tests giving positive or doubtful results were repeated, 40 of the 73 initially positive and 22 of the 117 initially doubtful results being confirmed. Clinical evidence suggesting the possibility of syphilitic infection was obtained in 21 of the 40 students with confirmed positive reactions and in 5 of the 22 doubtfuls. The remaining 19 positive and 17 doubtful reactors gave no evidence of syphilis; nevertheless it is probable that at least some of them were really cases of latent syphilis because they mostly occurred in colleges where the incidence of syphilis was greatest. As a result of statistical calculations Eagle considers that 26 of them may be accounted for in this way; leaving only 10 students with confirmed positive or doubtful serological tests for syphilis but no other evidence of such infection.

These results are hardly likely to lessen our confidence in the reliability of serological tests for syphilis, since the proportion of healthy persons giving positive or doubtful reactions appears at most to be about 1 to 4000 and even these may all have been cases of latent syphilis. It is wise to remember, however, that a larger proportion of patients suffering from miscellaneous diseases other than syphilis might give false positive reactions, because according to Sachs any person with an increased sedimentation-rate is more liable to give such a reaction than a normal person. The question whether an absolutely healthy person ever gives a positive reaction if technical errors are excluded remains unanswered, but Eagle tells us that an attempt is being made to distinguish any such "biologic false positives" from cases of latent syphilis. The positive reactors discovered in his investigation obviously provide good material for such an attempt.

1. Sachs, H. *Irish. J. med. Sci.* February, 1941, p. 57.
2. Sherwood, N. P., Bond, G. C. and Clark, H. F. *Amer. J. Syph.* January, 1941, p. 93.
3. Eagle, H. *Ibid*, p. 7.

A CORONER LOOKS BACK

Mr. Ingleby Oddie's "Inquest"[4] is not so much an autobiography as a selection of his case-records collected during 38 years, first at the bar and then as a London coroner. Mr. Oddie is fortunate in his subject—human degradation is always popular—and most of the cases he describes being victims of such household names as the Ripper, Steinie Morrison and Crippen are, in medical jargon, sufficiently unusual to be worth recording. It is not enough to have something worth saying, for even the worst newspapers have that, but to say it well, as Mr. Oddie does, and to avoid melodrama and false embellishment, is good workmanship. His stories tell their own tale; his effects come from plain records of speech and action and the emotional monotone is broken only by the actual voice of the victim or the seemingly inconsequential remark of a condemned man. Inevitably he recalls De Quincey; he has the crime æsthete's gusto for detail and the scientist's joy in piecing detail into a reasonable whole. Enthusiasts, whether botanists with a lust for alpine saxifrages or criminologists who travel miles to see how the murderer escaped through a closed courtyard, readily become bores unless the listener is quickly converted into something of a fellow enthusiast. The minutiæ of each case-report in this book are almost as interesting as the main stories, and that is the real test for the reader. Even coroners have dull moments, and commonplaces like rape and suicides have to be dealt with; but these minor events are enlivened by

4. London: Hutchinson and Co. Pp. 255. 16s.

glimpses behind the scenes. The publishers commend the book to students of human nature, but apart from references to the generosity of the poor, on the one hand, and to the ease with which medical evidence can be bought on the other, there is little about the effect of social conditions on human conduct or crime. An author with such obvious qualifications might well have said more about the psychology of criminals. Even if, as he believes, English prisoners are more comfortable than any in the world it is important to know why so many second (not first) offenders subsequently find little inspiration or aptitude for normal life. Perhaps the fact that Mr. Oddie took his medical training in Edinburgh has something to do with his scrupulously objective attitude.

PHONOCARDIOGRAPHY

In spite of the modern ring about the name it is nearly fifty years since the first investigations on phonocardiography were carried out by Fredericq.[1] It is still regarded by many clinicians as one of those extras which may amuse laboratory workers but are of little help to the patient. Orias, Braun-Menéndez[2] and Mannheimer,[3] however, have demonstrated the practical value of this way of investigating the heart-sounds. Two methods have been used in the past: direct phonocardiography and phonocardiography with electrical amplification. In direct phonocardiography the vibrations of the chest wall are magnified by optical means and recorded on a screen or moving film; this method, which has been used by Wiggers and Braun-Menéndez, involves the use of a suitable membrane and will only record frequencies between 30 and 150 cycles per sec. These disadvantages are partly offset by the avoidance of electrical disturbances. In phonocardiography with electrical amplification, which has been adopted more generally in Europe and America, the vibrations of the chest wall caused by the sounds of the heart are registered by a microphone in which corresponding electrical vibrations are produced, and these in turn are transferred by an oscillograph to a moving film. Mannheimer uses what he calls calibrated phonocardiography, in which the sounds are split up according to their pitch and amplitude. By distinguishing six different frequency ranges (up to 1000 cycles per sec.), and by simultaneous registration of the sounds within the different frequency ranges, it is possible to analyse the heart-sounds and discriminate between fundamental tones and overtones. This method also has the advantage of eliminating electrical disturbances to a great extent. By means of a calibrated microphone the amplitudes of the sound phenomena can be read off in units of pressure (dynes per sq. cm.) and thus it is possible to obtain comparable results in different people and the same person at different times.

Phonocardiography has been of greatest value in relation to the third and fourth heart-sounds. The third sound is seldom detected on auscultation because of its almost complete lack of overtones. Mannheimer, confirming the work of others, found it present in some 70% of normal children and also recorded it in 6 out of 17 infants under one year. It is now generally conceded that this sound is the result of vibrations set up in the ventricular wall by the rapid inrush of blood from the auricles; it occurs 0·08–0·18 sec. after the second sound. The fourth, or auricular, heart-sound is also rarely heard on auscultation, again because of its lack of overtones. It can be recorded by the phonocardiograph in most normal people, and comes at the end of diastole, 0·02 sec. before the Q wave in the electrocardiogram and 0·07 sec. before the first heart-sound. Both the third and fourth sounds can be differentiated from reduplication of the second sound because they come much later in diastole. Phonocardiography records a systolic murmur in almost all children, although it can be heard in only about a third of them, and the phonocardiographic record detects no difference between the audible and the inaudible murmurs. This confirms the clinical dictum that soft systolic murmurs are in themselves of no significance; only when they increase in intensity or alter in character can they be regarded as pathological. In children variations in amplitude of the heart-sounds at different ages are evidently largely dependent on the thickness of the chest wall. A relationship between the amplitude of the first sound and the heart-rate has been demonstrated which probably accounts for the increased intensity of the first sound after exercise; the greater amplitude of the first sound with the child in the erect as compared with the recumbent position also largely depends on the increased heart-rate.

Mannheimer has made a phonocardiographic study of 90 patients under seventeen years with congenital heart disease. He found that in these youngsters the first and second sounds have a bigger amplitude than usual, principally owing to the increased heart-rate, while the third sound has a smaller amplitude and the fourth sound shows no appreciable change from the normal. In 90% the systolic murmur was not only stronger but also reached higher up the tonal scale than in health. In cases of patent ductus arteriosus the continuous murmur was always recorded, but it was often described as a systolic murmur on auscultation. In 23 children the phonocardiogram showed the first sound to be accentuated, but in only 1 of these was the accentuation detected clinically; the comparable figures for accentuation of the second sound were 32 and 11. Gallop rhythm was never detected on auscultation, but by means of phonocardiography some abnormal third and fourth sounds were recorded. Calibrated phonocardiography clearly removes many of the disadvantages inherent in methods of recording the heart-sounds, and with its aid we should be able to assess the precise significance of changes in the heart-sounds in myocardial failure, of reduplicated sounds and of gallop rhythm. It may also help in the diagnosis of cardiac aneurysm by revealing changes in the heart-sounds or typical murmurs at a stage when neither auscultation, radiology or electrocardiography can detect anything abnormal.

1. *Zbl. Physiol.* 1892, **6**, 257.
2. Orias, O. and Braun-Menéndez, E. The Heart-sounds in Normal and Pathological Conditions, 1939, London.
3. Mannheimer, E. *Acta pædiatr., Stockh.* 1940, **28**, suppl. 2.

RESPECT FOR THE INJURED HEAD

Even in trivial head injuries elementary principles of surgical technique must be observed if healing is to be satisfactory. On our opening page McKissock and Brownscombe record dismally that of 27 men with scalp wounds operated on before reaching the neurosurgical centre primary healing occurred in 2 only. This result is attributed to inadequate attention to simple points. The hair was removed only in the immediate vicinity of the wound, splintered bone and even foreign bodies were left behind, the edges of the wounds were not excised completely or cleanly, and the scalp was sutured with one layer of silkworm-gut only. Cairns[1] has seen similar unhappy results which he traces to exactly the same faults, and he reports a fatal case of abscess formation following perfunctory cleaning of a scalp wound. He says that the most common mistake is to regard the repair of a scalp wound as a minor procedure to be performed in an aid-post or a casualty room, and that from the point of view of conserving man-power cleaning and closing a scalp wound is much more important than removing a foreign body from the brain. He urges full aseptic precautions, careful exploration and excision under adequate anæsthesia, the local use of sulphonamides, and closure in two layers. The subsequent management of head injuries is of equal importance. McKissock and Brownscombe confirm the statement of Russell and others that subarachnoid bleeding

1. Cairns, H. *J. R. Army med. Cps*, January, 1941, p. 12.

has no relationship to intracranial pressures; they advise repeated lumbar drainage in cases with bloody cerebrospinal fluid and high pressure, if only for the relief of symptoms. In this they add support to the recent findings of Rowlette and Weiner.[2] These workers lowered the annual fatality for head injuries in a large general hospital from 38·9 to 25·8% by using repeated drainage in patients who had high intracranial pressure as a result of the injury. Pickles[3] reports his results in 554 cases of head injury and also advises repeated lumbar puncture, with the use of hypertonic solutions and limited fluid intake if the pressure remains high. Lumbar puncture should be performed after the initial period of shock has passed, to discover whether blood is present in the cerebrospinal fluid and to measure its pressure. Thereafter puncture should be repeated every few days, or even daily if necessary, to relieve headache and restlessness, until the pressure has returned to normal and the fluid is clear. The picture may, of course, be complicated by clear fluid with persistent high intracranial pressure, or by the appearance of progressive signs of cerebral damage, but management then falls outside the application of rule of thumb and must depend on experienced judgment.

HOSPITAL QUARTERS FOR MENTAL PATIENTS

ALL too slowly the segregation of mental disease is giving place to the inclusion of mental treatment wards in general hospitals. The York Clinic at Guy's was completed, if not opened, a few weeks ago [4] and now we learn of a similar treatment block which has just been put into commission at the New York Hospital, Westchester Division. The building is dedicated to the memory of Dr. Charles H. Nichols, who planned and supervised the building of the first government hospital in America for the mentally ill—St. Elizabeth's Hospital in Washington. He was superintendent there for twenty-five years and subsequently held the same position at Bloomingdale Hospital until he died in 1889. His keen interest in construction of hospitals for the mentally ill took practical form, not only in St. Elizabeth's and at Bloomingdale, but in many of the state hospitals of America, Australia and Newfoundland.

The new Nichols Memorial Cottage, designed to house twenty disturbed women patients, is a one-story building of brick and concrete, made up of two wings forming an L. A quadrangle for recreation is completed by corridors running along the other two sides; these lead to the treatment departments and general services of the hospital. The many windows look outwards on the grounds as well as inwards on the quadrangle. They are closed and sound-proof, with special inside window screens in the patient's bedrooms and unbreakable glass elsewhere; no grills or guards are used. The whole cottage is air-conditioned, the system of air intake and exhaust providing four changes of warm, humidified or cooled air every minute. Partitions and doors are all sound-proof, and rubber-tiled floors and acoustical plaster on ceilings and walls of neighbouring walls deaden reverberation. Mental patients are often distressed by the outburts of their neighbours, a point which their relations are apt to exaggerate and their doctors to discount. This aspect of mental hospital life possibly retards recovery more than administrators hope. The quiet of the memorial cottage will be therapy in itself.

It contains fourteen single bedrooms and one six-bed dormitory, two sitting-rooms for patients and two visiting-rooms. No mention is made of occupational rooms but probably the sitting-rooms are used for this purpose. Messrs. Thompson and Walford, the architects, who helped to design the York clinic, emphasise particularly the importance of occupational rooms in mental hospital construction; certainly this side of therapy is gaining ground every year, literally as well as figuratively. It is as well to provide spacious accommodation for it at the start. The designers of the memorial cottage, like those of the York Clinic, have aimed at making the rooms restful, warm and comfortable, while ensuring also that they are sanitary and easily cleansed. Natural finished wood doors, special lighting and pleasantly coloured furniture and curtains have achieved this, safely avoiding the institutional effect which patients and their relations dread.

At the angle of the two blocks there is a glass enclosed station from which a charge nurse can supervise the corridors, sitting-rooms and dormitory; she is in touch by a signal system with the separate treatment rooms. The building also houses its own shower and bath rooms, some with continuous-flow equipment, a pack room and blanket dryer, a special treatment room, a clothes room with patients' lockers, a linen room, utility room, dining-room and serving pantry. The governors of the society of the New York Hospital say that physicians will always be welcome visitors to the memorial cottage. When the Atlantic once more becomes a highway no doubt some of us will be accepting that invitation.

TALCUM GRANULOMA

THE unconsidered trifles left by surgeons in wounds often provide pretty problems for the histologist. Leaving aside the better-known foreign bodies such as cotton fibres and suture materials, E. J. McCormick and T. L. Ramsey[1] suggest others that may assume clinical importance. Thus talcum powder, used on the hands and gloves before starting an operation, contains magnesium silicate and sometimes lycopodium spores, and both of these, when introduced into the tissues, can stir up a granulomatous reaction somewhat resembling tuberculosis. McCormick and Ramsey describe two cases in both of which laparotomy was first performed for suppurative salpingitis. After uneventful recovery each returned with symptoms due to adhesive peritonitis, and a second laparotomy, performed 7–8 weeks after the first, disclosed a local inflammatory condition of the pelvic peritoneum with adhesions resembling, in the first case, granulomatous tuberculosis. Microscopically the similarity to tuberculosis was largely maintained in both cases: there was a granulomatous—in places caseous—reaction associated with large foreign-body giant cells in which occasional crystals of magnesium silicate were recognisable. Most surgeons are careful to wash off any excess of powder before starting to operate, but the use of less irritant powders might well be considered. J. W. Miller and R. R. Sayers[2] have injected a large variety of industrial dusts into the peritoneal cavity of guineapigs, and from the histological effects produced in the peritoneum within 90 days they classify the dusts into proliferative, absorptive and inert groups. Talc falls into the so-called inert group, but from the account they give of its behaviour it cannot be dismissed as harmless. Members of this group persist in the peritoneal cavity and cause both fibroblasts and macrophages to proliferate; the nodules so formed tend to become flattened in time but apparently do not disappear—indeed, Miller and Sayers found as much of the dust in the peritoneal cavity at the end of a year as at the end of a week. Dusts of the absorptive group, on the other hand, excite only a transient reaction, and the only trace eventually left of them seems to consist of particles of brown pigment, apparently of endogenous origin. Such dusts would therefore be suitable for use on the surgeon's gloves. Those of the group tested by Miller and Sayers were mainly varieties of calcium carbonate, and this compound, finely divided, might reasonably be used instead of talcum powder.

2. Rowlette, A. P. and Weiner, D. O. *Surg. Gyn. Obstet.* March, 1941, p. 551.
3. Pickles, W. *New Engl. J. Med.* January, 1941, p. 139.
4. See *Lancet*, April 19, p. 513.

1. *J. Amer. Med. Ass.* 1941, March 1, p. 817.
2. *Publ. Hlth Rep. Wash.* Feb. 14, 1941, p. 264.

Special Articles

THE PREVALENT DISEASES OF ITALIAN EAST AFRICA

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THE Italian Empire in East Africa comprised three contiguous colonies, more or less complementary to one another; of these, Abyssinia is the least, and Eritrea the most highly developed.

The kingdom of Ethiopia (350,000 sq. miles) is for the most part characterised by a great central plateau of a mean height of 7000–8000 ft. intersected by deep ravines, the chief of which is the great Rift Valley through which the river Awash flows, at a depth of 3000 ft. below the mountain levels.[1] The mountain ranges assume the most fantastic shapes, rising to 12,000 and even 15,000 ft., and on the northern, southern and eastern aspects great rivers arise to join the Atbara, Blue Nile and the Indian Ocean; it is, therefore, possible to pass in a day's journey from torrid to almost alpine conditions. In the valleys and lowlands the vegetation is dense and the heat tropical, but the plateaux are comparatively bare, cold, windy and sometimes almost subarctic. The south-eastern borders (Ogaden) are flat, dry, hot and semi-desert. The incidence of the abundant rainfall varies in different parts of the country and the rains move from north to south. There are two main seasons, the dry (*bagà*) season from October to mid-June and the intensely wet (south-west monsoon) season from then to the end of September. The period of the little rains is about the middle of March.

Eritrea, the most productive and important of these possessions, occupies an area of 15,754 sq. miles and may be regarded as the northern extension of the Abyssinian plateau; its average height is 7000 ft. The only river of importance—the Barca—is not perennial. The climate of the highlands is temperate, especially in the region of Keren, Asmara and Agordat. The coastal region of the Red Sea is torrid and oppressive. The rainfall is intermittent, being determined by the direction of the winds and condensation of the saturated atmosphere from the Red Sea.

In antithesis, Italian Somaliland, occupying an area of 200,000 sq. miles and known as the pearl of Italian East Africa, is mostly desert and intensely hot. The northern part is sparsely inhabited; the central portion, containing the port of Mogadishu, is well watered and irrigated by the Shibeli river descending from the Abyssinian highlands. The southern portion of Jubaland, bounded by the Juba river, is arid and clothed with desert scrub. The heat is tempered by the monsoons for eight months of the year, the south-west monsoon blows from May to August, and the dry and hot north-east (the native *gilal*) from October to March. Intermittent rains accompany the south-west monsoon.

MALARIA

In Africa malaria takes pride of place as chief impediment to European colonisation, and in Abyssinia the incidence of various forms of malaria is exceptionally wide in spite of the mountainous nature of the country. Below 3000 ft. malaria is endemic near permanent collections of water; and during the rainy seasons, from July to October, it appears in epidemic form. In the south-eastern desert districts malaria is present also in the dry season in the vicinity of perennial streams, increasing to epidemic proportion during the rains. Between 3000 and 4500 ft. malaria is largely seasonal, and throughout this zone two epidemic seasons occur, from April to June and again from September to November. Even at this altitude malaria is so widespread that spleen rates up to 90% are recorded by Lega, Raffaele and Canalis (1937). The chief forms are, as elsewhere in Central Africa, *Plasmodium falciparum* (the subtertian), and *P. vivax* (benign tertian). Pansini (1939) states that the Italian workers on the roads in the lowlands are heavily attacked, in spite of quinine prophylaxis, and that malignant infections predominate at first and the benign tertian form appears later, although both were acquired at the same time. Endemic malaria occurs to a lesser extent between 4500 and 6600 ft., above which, according to Corradetti (1938), Raffaele and Lega (1937), Lega, Raffaele and Canalis (1937), and Lorrezoni (1938), indigenous malaria has not been recorded, but it is difficult to reconcile these statements with the experience of Nägelsbach (1934), a German practitioner who, in a comprehensive paper on Ethiopian diseases, found 10 indigenous cases of *P. vivax* in Abyssinian residents of Addis Ababa (8175 ft.). It is probable, however, that on account of the prevailing climatic conditions this occurrence is exceptional. On the extreme slopes of the highlands it may be taken that *P. vivax* is mostly in evidence, while in the southern and eastern districts *P. falciparum* predominates (75% of the total). In the strategically important district of Dessye it is recorded that malaria is endemic throughout the year, though Corradetti (1939) observes that in parts of the Gondar region malaria is entirely absent in the dry season. Raffaele and Lega (1937) have found a special form of subtertian parasite whose morphological characteristics differ sufficiently in their opinion to constitute a subspecies—*P. falciparum*, var. *œthiopicum*—in which the crescents are shorter and broader than in the normal type. On the other hand, Mosna (1939) has found no appreciable difference between Ethiopian strains of *P. falciparum* and those of Italian origin as regards their clinical manifestations or their capacity (in Italy) to develop in *A. maculipennis*, var. *atroparvus*. V. Chiodi (1936) has recorded the various clinical types of subtertian malaria commonly observed, such as the dysenteric, bilious remittent and cerebral; blackwater fever is not uncommon in endemic areas. No mention is made of quartan (*P. malariæ*) or of ovale tertian (*P. ovale*), though it is more than probable that both these parasites will eventually be found in this part of Africa. B. Wilson has recently described what he suggests is a new species of malaria parasite, *P. wilsoni*, among southern Abyssinians (Roberts 1940); as far as is at present known, it closely resembles *P. ovale*, but is considerably larger in fully developed forms and the host cell is larger than in *P. vivax*. The number of merozoites is 10–12; stippling of the corpuscle is often absent, but, when present is finer than Schüffner's dots. It is to be hoped that malariologists attached to the Imperial Forces will use every opportunity to investigate the exact status of this parasite.

Anopheles gambiæ Giles. The best known, most dangerous and widely spread carrier of malaria in the whole of Africa. It is adaptable, and has within recent years been introduced into Brazil, where it is now spreading rapidly and concurrently with subtertian malaria. This is a medium-sized species, the general coloration being yellowish brown. The female has palpi with three pale bands. The femora and tibiæ are speckled; the wings are abundantly speckled, with the third main dark area interrupted on the first vein. The breeding places of *A. gambiæ* are extremely varied, but in most parts it breeds in small pools, usually partly exposed to sunlight; other sites are puddles, shallow ponds, pits, animal footprints, small collections of water at roadsides, ditches, seepages, the drying-up beds of streams and the borders of lakes and swamps afford appropriate sites. An important source of the larvæ may be found in the shallow overflow of streams or drains. *A. gambiæ* feeds mainly on human blood and enters dwellings in large numbers in most regions where it abounds. In many towns it is the only domestic anopheline.

A large number of anopheles mosquitoes are indigenous to Abyssinia (La Face 1937, Evans 1938, Corradetti 1939). As elsewhere throughout tropical Africa, *A. gambiæ* (see figure) and *A. funestus* appear to be chief vectors and the following species are also listed: *A. cinereus, christyi, demeilloni, d'thali, garnhami, mauritianus pretoriensis, rhodesiensis, turkhudi.* At high altitudes *A. cinereus* and *demeilloni* only are found.

In Eritrea, which has a population of 600,000 with a density of 5 per km., malaria is everywhere prevalent, according to Mirra (1938); 75% of infections are due to *P. vivax*, 20% to *P. falciparum*, and 5% to *P. malariæ*.

1. The physical geography, so far as it concerns the present campaign, has been admirably described in the *Times* (March 31, 1941).

Giordano (1936) states that malaria becomes common towards the rainy season, especially in the late winter and early spring in the eastern plains. In this colony the maximum diffusion of malaria does not occur above 3300 ft., though it is said to sometimes arise in Asmara at 7900 ft. *A. gambiæ* and *A. mauritianus* are the chief vectors.

In Somaliland malaria is absent from the arid deserts which constitute the major part of the colony, but is widely spread in the cultivated and irrigated Shibeli area where *A. gambiæ* abounds. Lega, Raffaele and Canalis (1937) aver that *P. vivax* cases outnumber *P. falciparum*. Quartan malaria is to be found, as in the Mediterranean and elsewhere, mostly in small children. Croveri (1935) states that the proportion is *P. vivax* 44%, *P. falciparum* 30%, and *P. malariæ* 26%. Severe epidemics of malaria have been recorded amongst the Somalis, in one of which pneumonic symptoms predominated so that it was at first suspected to be pneumonic plague.

LEISHMANIASIS

Both the visceral type of Leishmaniasis—kala-azar—and the cutaneous form—oriental sore—occur throughout Eritrea and Abyssinia to a hitherto unspecified extent (Speziale and Berger 1939). Italian records are extremely vague in this respect, but that kala-azar is probably widely spread in western Eritrea is suggested by the proximity of the Kassala district of the Sudan where a focus of this disease has been known to exist for over 30 years, and by scattered areas of leishmaniasis in the Fung district of the southern Sudan which adjoins western Abyssinia, as have recently been described by Archibald and Mansour (1937), and the similar foci of infection in the extreme south-west in the triangle adjoining the Uganda-Kenya border. Poggi has recorded oriental sore amongst the population of the Agame district of Abyssinia and Conti the occurrence of leishmaniasis among dogs (*Leishmania canina*) in Eritrea.

TRYPANOSOMIASIS

Human trypanosomiasis has not yet been discovered in Abyssinia, but various species of tsetse fly (*Glossina*) are found in the south; *G. morsitans*, for instance, has been found on the river Didessa, a tributary of the Blue Nile, *G. palpalis* (the normal vector of *Trypanosoma gambiense*) abounds on the river Omo which flows into the north end of Lake Rudolf, and, according to Ghidini (1938), *G. longipennis*, *brevipalpis*, *austeni* and *pallidipes* have also been recorded. The upper altitudinal limits of distribution of tsetse flies in this country is unknown but probably not above 3000 feet. In southern Somaliland *G. pallidipes* is commonly found along the Juba river and is the vector of animal trypanosomiasis in that area.

RELAPSING FEVER

Relapsing fever is widely distributed throughout the regions under consideration. In Eritrea both the louse-borne form (*Spirochæta recurrentis*) and the tick-borne form (*Sp. duttoni*), conveyed by the soft tick, *Ornithodorus moubata*, have been recorded by Giordano (1936); di Benedetto (1939) has analysed 193 cases of *Sp. recurrentis* infections from this area and finds the liver and spleen enlarged in the initial febrile periods. Most cases are slightly jaundiced and the majority have albuminuria and glycosuria. In Abyssinia, where there is a heavily louse-infested population, it is not surprising to learn that relapsing fever is common. On the high plateaux it is entirely the louse-borne variety (Scaffidi 1937); but in the valleys "tick fever" is the rule and is conveyed by *Orn. moubata*, a tick which does not live above 6000 ft. Many mixed infections of relapsing fever and subtertian malaria are encountered (Taddia 1938). In Somaliland relapsing fever is almost entirely tick-borne. An allied species of tick, *Orn. savignyi*, is abundant there as well as in Abyssinia, and has long been under suspicion as a vector on epidemiological grounds (Moise 1938), but proof has not been obtained under laboratory conditions (Kirk 1938). Bergsma (1928) has stated that in Italian East Africa, as a general rule, one intravenous injection of neosalvarsan, 0·6–0·7 g., or novarsenobenzol, prevents further relapses, but that jaundice may ensue as a result of such treatment. Relapsing fever is also commonly associated with subtertian malaria in Somaliland (Taddia 1938).

YELLOW FEVER

The range of yellow fever in Africa extends much farther in a northward and eastward direction than was formerly supposed and even to western Abyssinia. De Lotto (1940) describes in that region bilious fever with icterus, blackish vomit and hæmoglobinuria in which quinine was useless. The frequency of the universal vector of the virus, *Aedes ægypti*, in this district is not given, nor are there any records of pathological examination of the liver, but the clinical description tallies with that of yellow fever.

It is necessary to appreciate that the yellow-fever virus has been found to extend over a much wider area than the clinical manifestations it may evoke. This has been established by the application of the "mouse-protection test" to samples of sera obtained in the areas under investigation. This test proves immunity to the virus of yellow fever. Sawyer and Whitman (1936) have shown that such immunity is widely spread in an irregular manner in a region extending from the coast of Senegal eastward for some 3300 miles to the upper reaches of the White Nile in the Sudan. In 1934, Hewer discovered a case of yellow fever in Wau, in southern Sudan, on a tributary of the White Nile. Findlay (1938) found that in the Fung area on the western Abyssinian border 10–50% of the sera showed immune bodies and concluded that the yellow-fever area probably extended to the foothills of the Abyssinian plateau. Atkey (1939) has reported that in Malakal on the White Nile the immunity-rate rose from nil to 18% in 4 years; yet in this period there was not a single recognisable case of yellow fever and *Aed. ægypti* is almost non-existent there. This finding, together with other scraps of evidence from West Africa (O'Brien 1939), conjures up the possibility of "jungle yellow fever" in Central Africa analogous to that found in Brazil (Soper 1938) and should be further investigated on the spot. These surmises have received recent confirmation. Hewer, who made a survey of the southern Sudan, brought forward evidence that yellow fever occurred in the Nuba Mountains in Kordofan about 1904, on the Bahr el Ghazal in 1928 and in Mongalla in 1927; now we learn that in the former locality there was a serious epidemic during the autumn of 1940 in the absence of *Æd. ægypti*, and that there were 1600 deaths in 15,000 cases.

TYPHUS

According to all authorities typhus is widespread throughout the high Abyssinian plateau and occurs in endemic and epidemic forms. Mariani (1939a) states that the endemic flea-borne form predominates, being the mild type formerly known as Brill's disease. Recent research has conclusively proved that this virus is of murine origin and that it is conveyed to man by the rat-flea. The epidemic variety is much more malign; it is essentially of human origin and louse-conveyed. Among Europeans benign cases are common but they are apt to acquire a more virulent type of infection when in intimate contact with native Ethiopians. It was formerly noted that there was a seasonal recrudescence of typhus during the rains, but owing to the building of roads and improvement of communications, this epidemic character is no longer as definite as it was. Prophylactic inoculation has been introduced and Mariani (1939b) reports on 13,000 vaccinations with transient reactions and favourable results.

In Eritrea, too, typhus occurs on a minor scale. Scaffidi (1937) stresses the admittedly difficult task of recognising the typhus rash on a black skin, where it may often assume the appearance of a transient exanthem. Tick-borne typhus (fièvre boutonneuse) and transmitted by *Rhipicephalus simus* is recorded from Eritrea by Giordano (1936).

MINOR FEVERS

Dengue and sandfly fevers are endemic in Somaliland and probably throughout the whole area. Massa and de Vivo (1937) record a great outbreak of dengue in 1936. It was remarked that the leucopenia was diagnostic. In Abyssinia Nägelsbach (1934) says that sandflies (*Phlebotomus*) are very common and sandfly fever prevalent.

PLAGUE

Plague has been recorded on several occasions in Somaliland. An epidemic was recorded by Veneroni in

1913. It usually takes the bubonic form, as in Mogadishu in 1918, and from 1922 to 1924 there were small epidemics in the Shibeli district where plague probably is rural, or sylvatic, and maintained in small desert rodents and jerboas (Croveri 1935). Pistoni (1938) has investigated the rat population of Eritrea, where the black rat is universally distributed and no brown rats exist. The ectoparasites are the fleas *Xenopsylla cheopsis* and *Nosopsyllus fasciatus*.

BACILLARY DYSENTERY AND AMŒBIASIS

There is very little accurate information regarding the dysenteries. Bacillary dysentery is probably common in the whole of East Africa, but to an extent hitherto unascertained. Amœbiasis appears to be widespread. It is absent in the desert areas of Somaliland, but common, like ankylostomiasis in the irrigated districts. In the village of the Duke of Abruzzi, Mattei found *Entamœba histolytica* cysts in the fæces of 30% of residents. The disease seems to arise mostly in chronic form, so that hepatic complications are extremely rare. This is said to hold good for all the territories under consideration.

GENERAL DISEASES

Lobar pneumonia is said to be very prevalent and especially fatal in Abyssinia. Little is known about the avitaminoses; beri-beri is fairly common on the Benadir Coast in Somaliland and is said to be of a mild type (Veneroni 1913). No mention of pellagra is made in any of the literature on this region, but probably it will be found here as elsewhere. Tuberculosis of an acute pulmonary form is widespread to an extent not accurately known throughout the whole of Italian East Africa, especially, we are told, in the neighbourhood of Mogadishu (Croveri 1935). Europeans who contract tuberculosis do not do well in this country. Nägelsbach (1934) states that tuberculosis of the glands, joints and skin is about as frequent as in central Europe. Leprosy is widespread, probably more so than in almost any other part of Central Africa. Chiodi (1936) says that nodular, anæsthetic and mutilating types are often met with. Its segregation and treatment are attended with great practical difficulties (Nägelsbach 1926).

Cerebrospinal fever was first noted in Eritrea in 1901 and since 1935 cases have occurred in Asmara, Assab, Agordat and Massawa. In 1937 an epidemic was recorded in Somaliland and Abyssinia, and its spread was attributed to the opening up of the country after the Italian conquest (Castellani 1939). Croveri states that in Somaliland fevers of the enteric group are unknown, but in Abyssinia they are common according to Nägelsbach. Very little work in accurate diagnosis, however, appears to have been done. Smallpox is prevalent throughout all these territories and its extent can be judged by the number of pock-marked faces to be seen; this is especially the case amongst the Somalis. The incidence is said to have decreased since the Italian occupation.

Ulcus tropicum appears to be very common throughout the whole region and probably also diphtheritic desert sore. Madura foot has been recorded from Mogadishu on the Benadir Coast by Polidori (1936), but most cases do not apply for treatment till they are beyond medical aid and amputation is necessary.

Rabies is one of the worst scourges of Abyssinia; jackals, hyenas and dogs are commonly infected, especially in the Harar and Jijiga regions. In Somaliland it affects camels and other domestic animals and in desert regions the disease is of considerable local interest in that the aardwolf (*Proteles cristatus*) has been found infected in British Somaliland by Godding (1934) and may transmit the virus throughout the whole of its wide range.

VENEREAL DISEASES

Venereal diseases are a pest everywhere in the region, especially in Abyssinia, and gonorrhœa is almost universal. The Somalis with some justification blame the Europeans for the introduction of syphilis into their community, where it is widespread and known locally as "frengi,"[2] meaning "foreigner," and this belief radiates through the whole of East Africa. All observers, but especially Nägelsbach (1934) in Abyssinia, call it "exotic syphilis"; he, stressing its mild character, considers that it stands halfway between old-world syphilis and tropical yaws. The congenital disease and the nerve complications are not seen. The suggestion has been made that the gravity of syphilitic infection, in Abyssinia at any rate, has been modified by the extremely prevalent malaria, but it is evident that it conforms on the whole to the mild form known elsewhere in Africa as Arab syphilis or "bejel."

That soft sore and lymphogranuloma inguinale (climatic bubo) are almost as common may be inferred from the romantic reports of Castellani (1939) to the Office Internationale d'Hygiène Publique. In these, gullible plutodemocrats are invited to believe that to Dessye, which is a military centre, hundreds of aristocratic Abyssinian girls flocked to become enrolled in a "corps of charmers," and begged the victorious Italian troops to obey the Duce's commands of the strictest sexual prophylaxis; as a result, we are told, no case of venereal disease has ever been contracted by the clientele of the Maison de Tolérance Blanche, instituted by the authorities on the spot!

The practical difficulties of distinguishing it from syphilis have militated against the recognition of yaws, but Croveri, who has had a long practical experience in Somaliland, says that classical yaws is common among the Somalis of the northern territories. Yaws is said not to occur in the highlands of Abyssinia (Castellani 1939).

HELMINTHIC DISEASES

The conditions throughout the whole of this area provide unlimited facilities for the spread of helminthic diseases; especially is this so in Abyssinia, which is facile princeps of all Africa in this respect. Owing to the custom of feastings on uncooked meat, almost every Abyssinian harbours a tapeworm, and since it takes two months, as Nägelsbach remarks, for the worm to mature, the average is six *Tæniæ saginatæ* a year; indeed it is considered a social disgrace not to be so blessed. An infusion of kousso flowers (*Brayera anthelmintica*) is regarded as a powerful vermicide and is taken by the higher class natives on an appropriate holiday known as "kousso flower day." The infusion exerts a direct toxic action on the parasite which is killed outright and broken into fragments. It is even recorded that if a big chief does not wish to receive a visitor he will excuse himself with the plea "this is my kousso flower day." Pork is not eaten to any great extent, so that *T. solium* infection is rare and is indeed unknown in Somaliland, because the Somalis subsist mostly on milk. In Mohammedans *T. solium* is, of course, not found, but the dwarf tapeworm, *Hymenolepis nana*, is common.

There are no figures regarding the prevalence of ankylostomiasis in Abyssinia, but Croveri states that in Somaliland it is widespread in the cultivated and irrigated Shibeli area where conditions favour its spread. The percentages range from 37% (Basili) to 50% (Mirra 1939). In the village of the Duke of Abruzzi, Bachelli (1936) found 38% of the population positive, and out of a total of 3250 examinations in the Merka district Talamonti found *Ancylostoma duodenale* in 55% and *Necator americanus* in 16%. In Eritrea, Huard (1937) estimates that 16–50% of the inhabitants have hookworm disease. Ascaris and oxyuris infections are said to be almost universal throughout the whole of Italian East Africa.

Bilharzia being essentially an African parasite, it is to be expected that both *Bilharzia hæmatobia* and *Bilh. mansoni* should be found. Along the Somali coast the former is widespread (Zavattari 1938) as in Egypt, being disseminated, it is said, mainly by religious practices. Carcinoma of the bladder is a common sequel. According to Girolami (1935) the vector in this area is not yet known. The appropriate molluscan host, *Bulinus*, is not recorded, though snails of the genera *Planorbis*, *Blanfordia* and *Ampullaria* are abundant. Bilharziasis due to *Bilh. mansoni* has been recorded in Abyssinians in Harar with enlargement of the spleen and hepatomegaly and the vector is *Planorbis adowensis* (Bourguignat 1879), which occurs locally (Giovannola 1939). An autochthonous focus of *Bilh. hæmatobia* has been recorded near Asmara (Huard, 1937), and *Bilh. mansoni* is also by no means uncommon. Satta (1935) has reported a case of this infection at the Dedda falls and cercaria-infected

2. In Ceylon yaws is known as "parangi," which appears to have had a similar derivation.

Plan. boissyi var. *asmarica* were discovered locally, though Giovannola (1939) states that it is a distinct species *Plan. ruppelli* (Dunker 1848). There is only one record of *Bilh. mansoni* in Somaliland (Bachelli 1936).

With regard to filariasis, little work has been done on *Wuchereria bancrofti* in these territories, but it is probable that limited foci exist, as in Egypt. Lüders (1937) has recorded microfilaria of *W. bancrofti* in the urine of one patient in Bedelle, Abyssinia. Cases of elephantiasis are not uncommon in Somaliland, and Croveri (1935) states that *W. bancrofti* probably occurs there. The discovery of isolated foci of onchocerciasis in northern Kenya makes it probable that *Onchocerca volvulus* may exist in southern Abyssinia, especially as the appropriate fly vector—*Simulium damnosum*—constitutes a great plague there (Mirra 1939).

The guineaworm, *Dracunculus medinensis*, has been reported from Somaliland, but it may have been an imported infection.

MINOR HORRORS

A search through the literature has unearthed a number of references to poisonous snakes. Pepeu (1935), who spent 4½ months on the Sudan-Eritrean border, records the capture of numerous *Echis carinatus* (the efa or phoosa, recognisable by the broad-arrow mark on the head), *Naja nigricollis* (the black-necked cobra), *N. haja* (the Egyptian cobra), and *Bitis arietans* (the puff-adder). *Atractaspis irregularis* and *Atr. magretlii*, viperine snakes characterised by small heads and enormous poison fangs, are abundant. Zanettin (1935) has described the ocular effects caused by the spitting of poison of the black-necked cobra. The venom has a proteolytic acid leading to necrosis of the conjunctivæ. In Somaliland the Egyptian cobra, the black-necked cobra, the phoosa and puff-adder are all common and in addition there are three species of *Attractaspis—engdali*, *leucomelas* and *microlepidota*. The venoms of the latter group have been studied by Pepeu and it has been found that the polyvalent antivenene in general use is protective. In Abyssinia all the species already mentioned are met with and *E. carinatus* is very common. In addition there is the deadly mamba—*Dendraspis angusticeps*—which may be uniformly either green or black. Scortecci (1938) describes a fatal case of this snake-bite in which death took place in 7 hours. *Sepedon hæmachates*, the spitting snake, or "ringhal's slang," can eject, for a distance of a yard or more, venom which, if it enters the eye, sets up severe conjunctivitis. *Psammophis sibilans*, the hissing sand-snake, is also found throughout this region.

The chigger—*Tunga penetrans*—constitutes a first-class minor pest and is a comparatively recent importation. In Abyssinia it was reported to be absent by Lambie in 1920, but 4 years later it was well established (Nägelsbach 1934). In Eritrea this ectoparasite is said to have been introduced from Somaliland 25 years ago. Scorpions are plentiful, but there is no reference in the literature to any peculiar features of the local species; their stings are as painful and incommoding as elsewhere.

COMMENTARY

Public opinion regarding the nosology of Abyssinia may have been greatly influenced by the official medical reports on the Italian conquest of that unfortunate country; these presented a rosy picture, whereas, on the evidence of the Italian observers quoted in this paper, none of the territories under consideration can honestly be described as health resorts. Some reference is obviously necessary to the account which Castellani has given to the world in his papers and lectures on the hygienic measures and hospital organisation of the Italian expeditionary forces during the Ethiopian War of 1935–36. Even a cursory examination demonstrates that the figures are to a large extent fallacious. It is necessary to emphasise this point since this report has been widely cited as the outstanding example of modern military hygienic achievement (see Scott 1939). It is only necessary to refer to a few of the obvious anomalies. The number of white troops engaged was over 500,000, and during the 7 months of war deaths from disease (including those from accidents such as drowning) numbered 599, which gives a figure for the annual death-rate of 2 per 1000; this puts the death-rate of the Italian Army at less than 2·9, the lowest annual figure ever recorded for the age groups 20–30 in the Registrar-General's Report for England and Wales under peace conditions and lower than the lowest to be recorded for the Italian Army in Italy. Nor need we regard seriously the remarks on the low incidence of malaria among the Italian troops during this campaign; this was ascribed to quinine prophylaxis in one of the most malarious countries in the world, in direct contradiction to the testimony of the Italian medical officers quoted in this paper. In a country teeming with tapeworms only two were noted in the Italian Forces. It can therefore be surmised that in this case political propaganda has overridden statistical accuracy.

I wish to express my indebtedness to the Director and Staff of the Bureau of Hygiene and Tropical Diseases for helping me to obtain Italian references to this region.

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SULPHANILAMIDE AND TANNIC ACID.—Mr. E. A. Lum, Ph.C. (Harrow) writes: During the course of research work on the sulphonamides it was noted that sulphanilamide was soluble in warm tannic-acid solutions. This fact, which as far as I am aware has not been published previously, may be of use to medical practitioners who employ tannic-acid solutions for the spray treatment of burns, and who may wish to add sulphanilamide to the spray. An aqueous solution containing 6% of tannic acid and 3% of sulphanilamide may be easily prepared by mixing the ingredients and warming until solution is complete. Such a solution, which must be employed whilst still warm, might be worthy of trial in the treatment of certain types of burn. Whether a loosely combined sulphanilamide "tannate" is formed in solution has not yet been ascertained.

GAS CASUALTIES
THEIR DIAGNOSIS AND TREATMENT

WHILE the possibility of the enemy using gas exists it must be the duty of every doctor to keep himself familiar with the main clinical features of gas poisoning and the essentials of treatment. The Ministry of Health is therefore issuing the following memorandum for our information.*

Of the poison gases likely to be used by the enemy there are two main types—the vesicants (mustard group) and the pulmonary irritants (phosgene group).

VESICANTS

Of the vesicants *mustard gas* accounted for upward of 70% of all our gas casualties in the last war. It can be employed in shells and bombs and sprayed from aeroplanes, but its dangers should not be exaggerated, for its fatality in the British army in the last war was little more than 2%, and 80% of cases were fit for active duty within a month. To secure such low figures, however, a high degree of gas-mask and other discipline is necessary. The early symptoms, which develop in the course of a few hours, include skin burns ranging from a slight erythema to severe blistering and affecting especially the softer skin and moist surfaces; blepharitis and conjunctivitis; laryngitis, tracheitis and bronchitis; vomiting. The sequelæ in the graver cases include corneal ulceration, bronchopneumonia and bronchiectasis.

The lesions may be caused by vapour or by actual droplets. The latter should be immediately removed from exposed skin by dabbing (not wiping) with a handkerchief or linen, which should at once be discarded. Bleach ointment or paste or Anti-gas Ointment No. 2 should then be applied to the skin. As soon as possible contaminated clothes and footwear must be removed and the patient must wash thoroughly with soap and water. Treatment of the eyes, if affected, should always be given preference over treatment of the skin. It should include immediate and free irrigation with water. To prevent secondary conjunctival infection, the instillation of Albucid in a 2·5% solution four times daily is recommended. Later atropine 1%, in ointment or in drops, may be used to counteract the pain of ciliary spasm. Liquid paraffin drops to prevent sticking of the lids may be employed after 12 hours. Cocaine preparations and bandaging of the eyes must on no account be allowed. Eye-shades may be used in the early stages.

Blisters should be aspirated with a hypodermic needle and syringe. For open skin lesions, after the stage of profuse exudation the recognised treatment for ordinary burns should be applied. Laryngitis and tracheitis should be treated with steam inhalations. Bronchitis and bronchopneumonia should be treated on general principles; sulphapyridine may prove valuable in preventing the latter.

In the last war there was a high incidence of functional sequelæ, including photophobia and blepharospasm, aphonia and vomiting. Early reassurance as to the unlikelihood of blindness, discountenancing a too long use of eye-shades, and so on, may play an important part in treatment. Once the early essential treatment has been given mustard-gas casualties may be safely evacuated to a distance as stretcher or sitting cases according to their severity.

In patients severely injured as well as contaminated with gas, elaborate washing and the like will be out of the question, but the clothes should be cut off as quickly as possible and local eye and skin contamination dealt with as effectively as the patient's condition allows. The order of urgency in such cases is (1) removal of outer garments and shoes, (2) methods directed towards saving life and treating shock, (3) saving the eyes, and (4) cleansing the skin.

Lewisite, besides being a vesicant, is also a lung and nose irritant and a tear gas and is readily recognised by its early effects on the upper respiratory tract. When present in large quantity on the skin it can be absorbed and cause severe arsenical poisoning. On the skin hydrogen peroxide (20 vols) or a 20% solution of hyperol (urea peroxide) is an effective counter-agent. If blisters form, they should be opened and the raw surface irrigated to lessen the likelihood of absorption. Otherwise treatment is as for mustard gas.

LUNG IRRITANTS

Phosgene is the most important of the lung irritants. It can be employed in shells or bombs. When the gas is present in very high concentration it may fatally asphyxiate people who are inadequately protected. With the more usual concentrations immediate symptoms may be slight or absent, but dangerous symptoms may follow even several hours after exposure. The likelihood of such symptoms developing is much increased if the exposed subject remains physically active. Every person who has been exposed to phosgene vapour without gas-mask protection should therefore become a stretcher case as soon as possible. On arriving in hospital or at a treatment centre cases should be grouped into mild, moderate and severe categories, and if possible these groups should be treated separately.

Mild cases show a reddish flush on the face, increased respiration-rate, and pain in the chest aggravated by coughing. Absolute rest, fresh air, fluids and nursing are the chief requirements, with careful watching lest any of them pass into one of the graver groups.

Moderate cases show greater respiratory distress, with varying degrees of pulmonary œdema, blue cyanosis, distended neck veins, a full strong pulse without a great rise in rate. Treatment is continuous oxygen by nasal catheter or B.L.B. mask (or in the less severe cases intermittent pure oxygen from a nitrous oxide bag), venesection and nursing care.

Severe cases show collapse, coldness, a weak rapid pulse, and pallor with leaden "grey" cyanosis and no distension of the neck veins. There is profuse pulmonary œdema, often with froth pouring from the mouth and nose, and great respiratory distress with shallow and largely diaphragmatic breathing and the chest in the inspiratory position. Continuous oxygen should be given in high concentration with the B.L.B. mask or double nasal catheter, the flowmeter delivering at a sufficient rate to maintain a pink colour in cheeks and lips. Venesection should not be attempted. It may be necessary to lower the head and raise the feet to allow the œdema fluid to escape more freely. Morphine is contra-indicated. Atropine and adrenaline are not required. Although there is hæmoconcentration and increased viscidity of the blood all forms of intravenous fluid are considered inadvisable owing to the risk of increasing the pulmonary œdema. Warmth and the most attentive nursing are essential. Patients may be restored to health after needing as much as 72 hours of continuous oxygen administration. Pneumonia is an occasional complication. Late sequelæ are rare.

Oxygen properly administered is a life-saving therapeutic agent both in the "blue" and "grey" cases. Evacuation of phosgene cases to a distance, until they have been pronounced out of danger, should be prohibited. Even the slightest cases should be under observation and at rest for 48 hours.

OTHER GASES

Carbon-monoxide poisoning may result from leakage from gas mains after air-raids or from the explosion of bombs in a confined space. Rest, restorative treatment, artificial respiration, and oxygen with carbon dioxide are the chief indications.

Tear gases and nose irritants do not produce casualties requiring hospital treatment. The main symptoms are lacrimation, sneezing, intense frontal headache, burning mouth and throat, nausea and tightness in the chest. In a gas-free atmosphere the symptoms usually pass off in an hour.

CONCLUSION

The gas-mask, if adjusted properly and in time, gives full protection to the lungs and eyes against all these gases. In a gas attack doctors will have a most important part to play, not only in recognising and treating cases and recording new phenomena but also in preventing panic by reassurance, by stressing the effectiveness of the protective and therapeutic measures at our disposal, and by insisting on gas-mask discipline.

* A revised edition of the War Office Medical Manual of Chemical Warfare (H.M. Stationery Office, 2s. 6d.) is now in preparation.

BRITISH EQUIVALENTS OF FOREIGN DRUGS

LAST year we published [1] a list of official pharmacopœial titles of foreign proprietary drugs now produced by British manufacturers. The General Medical Council has now approved names for further substances which are produced, or are likely shortly to be produced by British manufacturers, in some instances under licences granted by the Comptroller-General of Patents, Designs and Trade Marks. These substances have hitherto been known under other names. The question of including these substances in the British Pharmacopœia is under consideration, and if any of them is included the intention is that the approved name given below will be its official title.

Approved Name	*Proprietary Name*
Diodone	Perabrodil
Diphenan	Butolan
Dithranol	Cignolin
Hexazole	Triazole (Azoman)
Mesulphen	Mitigal
Pholedrine	Veritol

It is hoped that these approved names will be generally adopted.

WHY NOT NOW?

IMPORTANT tasks lie to hand which we simply cannot afford to put aside till after the war.[2] Regionalisation of hospital services is one of them. In his letter to a conference at Liverpool, Lord Derby pointed out that though the future may alter details the broad principles of regionalisation transcend the war. (His words have an added poignancy in view of the desperate straits in which some of the Liverpool hospitals now find themselves owing to the air peril. Pending the great scheme to replace the four branches of the United Hospital by one large hospital with medical school attached, it seems possible that on financial grounds two of the branches, removed to outlying areas, may have to close down.) The conference, which met at the suggestion of the Nuffield Provincial Hospitals' Trust, was attended by representatives of the Liverpool Hospitals joint advisory committee, of twenty-one local authorities, and of forty-seven voluntary hospitals from the proposed region which covers North Wales, takes in Liverpool, Bootle and Preston, and extends as far north as Carlisle. Mr. W. M. Goodenough, chairman of the trust, recalled that in 1937 the Sankey Commission had urged the regionalisation of voluntary hospitals in the interests of economy and efficiency, and at Oxford Lord Nuffield had provided the money to start a joint hospitals board on the lines suggested by the commission, but with the difference that the coördination of the public-health authorities with the voluntary hospitals was stipulated. The experiment had been a success and in 1939 Lord Nuffield had endowed the trust with a million Morris Motors ordinary share units to implement the scheme throughout England, Scotland and Northern Ireland. The income of the trust is to be used for administration and grants in aid, and the organisation will consist of divisional councils, each covering a large area and providing most important services; regional councils on each of which two or more divisions will be represented; and a central hospitals regionalisation council, on which all these bodies would be represented. Despite the war rapid progress had been made in setting up divisions and regions in various parts of the country. They aimed not at a state system but at a national system working in liaison with the Ministry of Health and based on local self-government.

Sir Farquhar Buzzard, chairman of the medical advisory committee of the trust, said he had found an encouraging consensus of opinion in favour of the scheme among laymen and doctors. Any scheme of regionalisation must provide all classes with easy access to the best that modern medicine and surgery had to offer. Today on economic grounds the more expensive and specialised methods of investigation as well as teaching and research must be centralised in key-hospitals, and in each region it would be the task of the medical advisory committee to arrange a proper distribution of services. Other problems, to be solved by good will and understanding and coöperation, were the remuneration of medical staffs in the voluntary hospitals, state subsidies and the extension of insurance and contributory schemes. Mr. S. P. Richardson, chairman of the provincial hospitals' regional committee, said there need be no interference with local tradition. The essence of the scheme was a partnership to give a better health service.

In the lively to-and-fro of the general discussion which followed these speeches possible difficulties of detail emerged: would infectious diseases' hospitals come within the scheme (they have not so far); would a local authority have the power to make contributions for administrative expenses to a non-statutory body like a regional council; would the best medical staff tend to concentrate in the central hospitals to the detriment of the outside hospitals; would voluntary hospitals still be allowed a preferential position in regard to training nurses and patients? Sir Farquhar replied that each region must resolve its own difficulties but the idea was to distribute rather than concentrate consultants. While the principle of regionalisation was generally accepted the conference, at Prof. Henry Cohen's suggestion, adjourned for the representatives to secure a local mandate.

1. *Lancet*, 1940, **1**, 804.
2. Lord Horder in the *Sunday Times* of April 20.

Public Health

Whooping-cough in Glasgow

THERE is nothing unusual about the recent epidemic of whooping-cough in Glasgow, nor anything exceptional about its fatality for young children. If the former is inevitable the latter should be a continual spur to medical endeavour. In Glasgow the disease is more or less prevalent every second winter. During the past winter the rise began in mid-October, 1940, gradually increasing until the new year. Like measles it travels through the city from one district to another, but now it is general with a weekly average of 600 + new cases. The total number of cases registered in the first six months of recent years is as follows:—

1933–34	3117	1937–38	1388
1934–35	10,691	1938–39	9453
1935–36	2106	1939–40	305
1936–37	6645	1940–41	8800*

* estimated.

Sex- and age-distribution for the first sixteen weeks of this year may be compared with the corresponding figures for 1939:—

—	1941		1939	
	Males	Females	Males	Females
	Per cent.		Per cent.	
– 1 year	7	7	8	9
– 2 years	9	10	11	10
– 5 ,,	33	31	33	32
– 10 ,,	49	50	46	47
– 15 ,,	1	2	2	2
15 + ,,	1	—	—	—

from which it may be observed that whooping-cough is very common in younger school-children. In so far as it can be reasonably computed for the current epidemic the case-mortality is 3·6%, being highest at the youngest ages: under one year 22%, under five years 4·6%. What Lord Horder calls a troglodyte existence cannot be said to have anything to do with the incidence or fatality, as shelter life plays little part in Glasgow.

From the Annual Reports

HORNSEY AND EAST HAM

The reports of two boroughs of the outer ring of the metropolis, Hornsey (R. P. Garrow, M.O.H.) and East Ham (Malcolm E. Barker, M.O.H.) make an interesting comparison, for the units are widely different in character. Their death-rates were nearly the same,

that of Hornsey being 11·2, that of East Ham 11·4; but the birth-rate of the former was 11·4 and of the latter 14·1. In Hornsey the stillbirth-rate was 35·9 and the infantile mortality 27. In East Ham these rates were 29·9 and 41. Mortalities from tuberculosis, cancer, diabetes and peptic ulcer were slightly higher in East Ham than in Hornsey but not significantly so, whereas that from appendicitis was nearly double in the latter.

Dr. Barker gives some facts about miniature screen photography for the recognition of early pulmonary tuberculosis, the most important of which is that the method makes it possible to examine 200 persons per hour. "The extension of this method in the future to periodic health examinations for the whole industrial community may prove an invaluable contribution to preventive medicine." We must wait for some years for a true verdict on the value of this measure, but the evidence should be collected as speedily as possible, for it may solve the outstanding problem of tuberculosis—how to detect progressive tuberculosis of the lungs at the earliest possible moment without drawing into the net cases which are dormant.

In Hornsey the population, birth-rate and death-rate have been nearly constant since 1932 and the two rates nearly equal, the averages being 11·8 and 11·6 respectively. The infantile-mortality rate of 27·25 in 1939 was a record.

CHADDERTON

Tables of the notifications of infectious diseases and of the fatalities from them and from influenza and cancer in 1912–39 are included in Dr. J. S. G. Burnett's report of Chadderton, an urban district in the Manchester area with a population of 30,000. These give a quick view of the history of disease during the past 38 years. The incidences of erysipelas, scarlet fever, pneumonia and tuberculosis have been halved; that of diphtheria is unaltered. The acute infections of the nervous system are distributed irregularly. Of 19 cases of encephalitis lethargica 16 were notified in 1924–27; poliomyelitis occurred in two years only, one giving 3, the other 2, notifications; and the 8 cases of cerebrospinal fever happened in six separate years, the only year to give more than 1 case being 1936 with 3. There was no fatality from smallpox throughout the period; none from the enterics since 1933 and only 5 since 1917; the deaths from tuberculosis and pneumonia have fallen by more than 50%, while those from cancer have roughly doubled. The diseases which the last generation held to be preventable have indeed been controlled by this, with the exception of diphtheria, which resisted until the coming of immunisation.

Infectious Disease in England and Wales

WEEK ENDED APRIL 26

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 0; scarlet fever, 1021; whooping-cough, 4187; diphtheria, 912; enteric fever, 26; measles (excluding rubella), 13,883; pneumonia (primary or influenzal), 1095; puerperal pyrexia, 123; cerebrospinal fever, 309; poliomyelitis, 6; polio-encephalitis, 2; encephalitis lethargica, 6; dysentery, 106; ophthalmia neonatorum, 81. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on April 25 was 1751, including: scarlet fever, 236; diphtheria, 343; measles, 373; whooping-cough, 351; enteritis, 19; chicken-pox, 78; erysipelas, 53; mumps, 11; poliomyelitis, 1; dysentery, 31; cerebrospinal fever, 64; puerperal sepsis, 6; enteric fevers, 8; german measles, 19; encephalitis lethargica, 2; other diseases (non-infectious), 72; not yet diagnosed, 84.

Deaths.—In 126 great towns there was no death from smallpox, 1 (0) from scarlet fever, 1 (0) from enteric fever, 32 (2) from whooping-cough, 10 (2) from measles, 27 (1) from diphtheria, 31 (5) from diarrhœa and enteritis under 2 years, and 37 (2) from influenza. The figures in parentheses are those for London itself.

There were 7 deaths from whooping-cough in Liverpool and 12 in Glasgow. Newcastle-upon-Tyne reported the fatal case of enteric fever.

The number of stillbirths notified during the week was 209 (corresponding to a rate of 38 per thousand total births), including 13 in London.

In England Now

A Running Commentary by Peripatetic Correspondents

WHAT has impressed me about the several thousand donors I have bled is the almost uniform way in which they react to the minor operation of blood-letting. If it is a first experience, they approach with apprehension and distrust the assurance that there is to be no pain. Outwardly they are calm and collected, but the practised eye knows the meaning of the thoughtful expression, the rigid attitude and the fast pulse. And this is confirmed when they are told that the worst is over, the needle being then in the vein. They smile, relax and almost invariably remark that "that was nothing to worry about." On subsequent visits there is of course no apprehension; there is no unknown to fear. While most of those who give the standard amount of blood (about two-thirds of a pint) feel fit and suffer no inconvenience, it is not to be expected that all the donors will be so fortunate. No searching test of the suitability of a donor is made, and if he says he is in good health and looks well he is accepted. But even the best of health is no safeguard against an upset if nervousness, fatigue and hunger are complicating factors. Whatever the cause or causes, the sequence of events in an upset is very similar. The donor lies very still and forgets to coöperate (as in opening and shutting the fist); the blood flow slows until it comes in drips; there is a slight restless movement of the limbs or whole body; a single deep breath is taken; and the eyes turn upwards. Consciousness is lost for a minute or two and the donor wakes up looking slightly bewildered and hoping that his lapse has not been noticed. Instead of unconsciousness there may be a hot sweat and sometimes the alimentary canal is disturbed enough to cause vomiting and diarrhœa. One very characteristic prodromal symptom of vomiting is the placing of the donor's free hand on his epigastrium. Much rarer variations of an upset are a generalised tonic contraction of the muscles (as in the second stage of epilepsy) and air-hunger. I have seen only one example of air-hunger in which the overbreathing lasted for a minute or two and produced tetany in the hands. Most of the reactions begin within a few minutes of the withdrawal of the needle from the vein and relapses are rare. In any case the discomfort is trivial in comparison with the good that these people are doing.

* * *

Two days ago I took a lad of 17 with schizophrenia up to Harley Street to have his first electrically produced convulsion. A few weeks before he had been in the window-smashing, voice-listening stage, but going up in the car—I am quite sure as a result of apprehension—he chatted quite sensibly. In a pleasant drawing-room the hawk-eyed specialist laid him down on a couch. "I'll just fix this flying-helmet thing on you"—a clever touch with a boy. He moved something in an unobstrusive little box and sent 90 volts for $\frac{1}{10}$ sec. through the patient's temples, whereat he had a prolonged epileptic fit. The boy woke up with amnesia for the event and the last part of the journey up; he said he felt as though he had played several hard sets of tennis. "Why does it act?" I asked. "Empiric," the specialist answered, meaning he hadn't the foggiest idea. I was left to ruminate over a chequered scrap-book. At school there were always boys who gradually became unbearable about the middle of the term (not quite to the schizophrenic stage of turbulence and inanity, but very nearly), got a good hiding or had a colossal row, and were comparatively reasonable for the rest of it. I recall various cheerful souls at hospitals, and lonely men in isolated bungalows throughout the world for whom the weekly, monthly or six-monthly "blind" was the price of sanity. I remember a liner on the beautiful diagonal run across the Pacific: on every trip at a point where pleasure had palled and the thought of arrival had not become exciting there were two days when the passengers quarrelled and complained about the excellent food. What is this rebellion against routine, however pleasant? Has civilisation acted as a protection against seasonal changes—the fear and hunger of winter, the sexual orgies of spring, the expansive abandon of summer, the gluttony

of harvest with its aftermath of hoarding, tailing off into winter's fear again? Does man pay a heavy price for disregarding these tidal waves of emotional cleansing? Was that convulsion I saw an artificial hunting in the undergrowth, the delirium that precedes migration, the icy fear of starvation that comes with snow? Were sanity, balance, reasonableness only occasional interludes between seasons in man's forming? By madness do we pay for disregarding the heavenly rhythm—dawn, noon, sunset: growing tension, orgasm, release? Is this the cost of aping the equanimity of the gods? Can it be . . . ? Is it . . . ? Can't the anthropologists . . . ? One is so abysmally ignorant. Anyway the boy seems quite normal today.

* * *

The review of Sylvia Anthony's "The Child's Discovery of Death" in THE LANCET of April 26 reminds me of a story told me by the late Sir Henry Head when I was his house-physician. Head stayed for a week-end with some friends who had spent an immense amount of time and thought on the upbringing of their child, a little girl of seven. All knowledge of death was to be hidden from her till she had reached an age when she could understand it. All visitors to the house, and all those in daily contact with her, were warned and forbidden to mention the fact of death in her presence, and no story-book was allowed to be read to her in which there was any reference to it. These theories were fully propounded to Head on the first evening of his visit. The next morning he was woken up long before anyone was about by someone tugging at his beard. He found the small daughter of the house standing by his bedside, and in a hushed whisper she said, "Dr. Head, Mummy says you know all about everything, can you tell me where I can buy methylated spirit? My lizard's dead, and I want to preserve it. It's no good telling Mummy and Daddy—they don't understand these things."

* * *

The other night the little town where the battalion is billeted got it. They were evidently trying for the docks some miles away, and it is easy to imagine the German pilot officer's report when he got back: "First we dropped incendiaries, setting several wharves and ships alight; then we dropped H.E. to finish off the job. Volumes of thick smoke showed that our bombs had got the oil tankers. Heil, Hitler!" So much for fiction; now for fact: "A large number of incendiaries were dropped in the fir woods setting alight not the trees themselves—they were too damp—but the dried pine-needles on the ground. Large volumes of smoke arose. Several high explosives were dropped somewhere near these fires, all in the woods except two which fell just short of the tenth green and have made a perfect bunker. God save the King!" About eight platoons were called out to fight the fires. It was a splendid Saturday night and everyone had great fun getting lost in the pine woods and shouting out his bearings. The messing officer was happily employed getting his cooks up to make cocoa, in the dark, for the fire fighters. The orderly officer telephoned to the mess to know whether the medical services were "running smoothly" The medical services were playing snooker against the C.O. and the mess president, and judging by their score were running very smoothly indeed.

It was lovely in the pine woods—the fairyland of childhood seen at last. Hundreds of Christmas trees with electric lights glittering through them and twinkling on and off. One bit of the ground would take fire, then another, then another, as quickly as that; and as soon as a new fire, no bigger than a man's hand, broke out an older one would be smothered by the soldiers. The best sight of all was the reflection of the fires in the windows of a big house on the outskirts of the wood. As some fires died and others sprang up the windows changed colours and the house itself seemed to melt and grow again, like a castle in a dream. First the fires shone only in the lower windows, and it looked long and low and strange; then, as some of the reflexions were obscured by smoke it dislimned into two shadowy cottages. And then the upper windows took the light and it was an ark floating on a cloudy sea. Yes—that was an evening to thank the Luftwaffe for.

Parliament

LAST week in the House of Commons Major LLOYD GEORGE, parliamentary secretary to the Ministry of Food, had no easy task in defending the policy and administration, but as he reminded his critics the Ministry was dealing with a very sensitive part of the human anatomy. Not only is the Ministry the largest trading organisation in the world, with accounts of over £600 million a year, but it must also deal with important social and economic problems. The department, he said, did not resent criticism, but could only distribute such food as it could acquire. In peace-time more than half of our food came from overseas, and of the other supplies, rather less than a half could be produced only through imported feeding stuffs and fertilisers. Leaving vitamins and carbohydrates alone and sticking to calories, which he claimed was safer and simpler, Major LLOYD GEORGE said that only a third of our needs was produced at home. There was no shortage of food in the world; the difficulty was to get it here. The Government has therefore restricted imports to essential commodities such as meat, sugar, tea, oils and fats. All these commodities, together with cereals and pulses, animal feeding-stuffs, condensed milk, milk powders, eggs, tea, dried fruits and fruit pulp, were now purchased by the Ministry. There was no comparison between the price-level of foodstuffs today and that in the last war and he claimed that on the whole the system of control was achieving equitable distribution at reasonable prices. The state was spending about £90 million a year in subsidising food.

The Ministry was fully alive to the importance of preventing the breakdown of food-supplies in heavily bombed areas and of providing emergency feeding-centres where people who cannot cook meals in their own houses can obtain hot meals. The Ministry had received applications from 114 towns with a total population of 16 million. So far 299 communal restaurants in 156 towns had been approved in addition to 170 London meals' centres operated by the L.C.C. and 280 evacuee centres taken over by the Ministry of Health and now open as British restaurants to the general public. This made a total of 749 and the average number of meals served daily was over 82,000. Referring to the new milk scheme Major LLOYD GEORGE explained that the Ministry expected distributors to continue distributing milk for seven days a week where that had been the practice. From now on there would be no cuts in the milk-supplies of people who took one pint or less per day. The scheme did not affect the priority classes, such as schools, hospitals and invalids. Domestic needs would be given preference over the demands of catering establishments.

Summing up his case he claimed no perfection for his Ministry and frankly admitted that mistakes had been made. But every effort was being made to set those mistakes right.

The general discussion ranged from important details to important principles. Mr. G. MUFF, for instance, had had a charming letter from the Parliamentary Secretary which, he averred, had almost made him want to chirp. Mr. MCKINLAY deplored how often the important memoranda of the "boys in the backroom" at Colwyn Bay quickly changed into "confidential wastage," and confessed himself appalled by the underworld of egg distribution. Sir E. GRAHAM-LITTLE returned to his attack on the Government bread and said that when he heard it called the "doctored loaf" he felt it was an insult to his profession. Many members were not altogether happy about non-rationed food in restaurants, and Mr. CLEMENT DAVIES said he had never seen his ration card since it was issued and yet had never wanted for food. Major Lloyd George had assured the House that only a thirteenth of the total meat-supply is consumed in public eating-houses, but Miss E. RATHBONE wanted to know what proportion of other foodstuffs was consumed there. Mr. D. L. LIPSON told of delays in setting up communal restaurants and of difficulties in obtaining food for school canteens. Mr. J. R. CLYNES regretted that there was no equivalent to the consumers' council of the last war. On the whole the House thought that so far the nation had been well fed, but that the

distribution of unrationed foods was often unfair and that couponless meals in restaurants had a bad psychological effect.

The Honourable Ladies' Prayer

MRS. MAVIS TATE who moved the annulment of the Personal Injuries (Emergency Provisions) Act 1939 said she did not do so as a feminist, but because she believed the regulations were unjust and if an injustice is allowed to continue in the body politic it is detrimental to the moral health of the nation. In 1939 the Minister had said "Pensions will be awarded on Service lines, that is to say, in accordance with the medically certified degree of physical disablement. Again, wages or earning will not ordinarily enter into consideration." The first regulations, which were afterwards withdrawn, awarded 20*s*. a week to a single man and 18*s*. a week to a single woman. In the second group of regulations a single man injured at home was awarded 35*s*. a week. This remarkable increase was the result of representations made by trade-unions. According to the present rates of compensation a woman over 18 injured in war work is awarded 28*s*. a week for the period of her disablement, or a weekly life-pension of 24*s*. 2*d*. if she is permanently 100% disabled, while a man receives 35*s*. and 34*s*. 2*d*. respectively. Dr. E. SUMMERSKILL who seconded the motion said that for the first time in history women were being registered for war work, and many were going to work in vulnerable areas. Were they to find they were not being treated equally with the men who worked at their side? Mrs. A. HARDIE pointed out that even the occupations traditionally considered suitable for women were dangerous today, when nurses were looking after their patients at the risk of their own lives. Sir FRANCIS FREMANTLE thought the principle underlying the case was whether men were to continue to be responsible for their families—though he admitted this did not cover single men; and Sir HENRY MORRIS-JONES contended that the disparity between the figures for single men and women was too great. In reply the Minister said that he had enjoyed the debate. He stoutly defended his regulations which were based on the new Workmen's Compensation Act, but instead of assessing each case separately he had taken an average which worked out at 35*s*. for men and actually at considerably less than 28*s*. for women. He felt it was not his fault that women in industry are not paid as much as men, and that the Government had done as much as it could be expected to at the moment. On a division 30 voted for the annulment and 80 against. Which seems to show that the next best thing to marriage is a good trade-union.

QUESTION TIME

Employment of Alien Doctors

Miss RATHBONE asked the Minister of Health whether, in view of the considerable number of fully qualified foreign doctors in this country, many of whom had been repeatedly tested as to their political reliability, yet were without employment, and some of them a charge on public funds, he would consider deferring arrangements for the bringing over of American doctors to this country until these doctors had been absorbed in the medical service.—Mr. E. BROWN replied: The American doctors are needed mainly for service with the Forces, whilst alien doctors of the European nationalities covered by the Medical Practitioners (Temporary Registration) Order, 1941, are needed mainly for employment in civil hospitals and institutions. The employment of the two classes can therefore proceed concurrently.

Miss RATHBONE then asked the Minister if he had considered the case of a doctor of German extraction, entitled to practise in this country and classified, after repeated inquiry, as a victim of Nazi oppression, who held a position in a hospital under the Ministry under a contract of service, was interned last June under the policy of general internment; was released in November; but has nevertheless failed to secure further employment, and had been refused payment of the unexpired five months period of his contract which, for no fault of his own, he was unable to fulfil; and whether he would say what he was prepared to do about this man.—Mr. BROWN: I am glad to say that, owing to a recent vacancy in the Emergency Medical Service, it has been possible to offer an appointment to this doctor at the same salary as he received before his internment.

Colonel ARTHUR EVANS asked the Minister how many friendly alien and allied alien doctors with special qualifications were still unemployed; how many Czechs with medical degrees in their own country were now studying for English degrees; whether this necessity must now be imposed on qualified men, particularly since special scholarships had to be granted to enable them to study; whether there was a surplus of army doctors with the Czech army; and whether, in view of the shortage of doctors, particularly in reception areas, the fact that alien doctors were barred from private practice, and the appeal that had been made to the United States of America for 1000 doctors to serve with the British Red Cross, he would take steps immediately to absorb all unemployed doctors, irrespective of nationality, and permit alien doctors already qualified in their own country to practise without taking English degrees.—Miss F. HORSBRUGH replied: I am not in possession of the information requested in the first, second and fourth parts of the question.[1] As to the third and fifth parts the Medical Practitioners (Temporary Registration) Order, 1941, provides a wide field of employment for American and allied alien doctors and refugee doctors of enemy nationality in hospitals and other approved institutions without the necessity of obtaining British medical qualifications, and their absorption into this service is proceeding steadily. I am advised that linguistic and other difficulties make it inadvisable to allow these doctors to engage in domiciliary practice.

Destroyed N.H.I. Cards

In answer to a question Miss HORSBRUGH said that many stamped National Health Insurance cards have been lost or destroyed by enemy action. To minimise the risk of loss of benefit all approved societies and local authorities have been advised of the simplified procedure to be followed in reporting such loss or destruction to the central department, so that credit may be allowed for the missing stamps with the utmost speed.

No Extra Rations for Pregnant Women

Dr. A. B. HOWITT asked the Parliamentary Secretary to the Ministry of Food whether he would consider the advisability of granting an extra half ration of butter and an extra half ration of sugar to all pregnant women for the last six months of the pregnancy, and for six months after delivery if the mother was nursing her baby.—Major LLOYD GEORGE replied: Consideration has been given to these suggestions, but the food rationing (special diets) advisory committee of the Medical Research Council consider that no extra allowances of any rationed food are necessary for expectant mothers. A child's ration book is issued by the local food office as soon as a birth is notified, the rations obtainable with this book being intended for the use of the mother.

Special Food for Young Children

Mr. G. MANDER asked the Parliamentary Secretary if he was now able to make a statement with regard to his proposals for dealing with the special needs of young children requiring such food as eggs and fruit; and whether these would be made available through clinics or through some other channel.—Major LLOYD GEORGE replied: A statement will be issued on this subject as soon as possible

Dr. HADEN GUEST: Is the Minister aware that the black currant, which is a heavy cropper in this country, can supply the same vitamins which is supplied by oranges; and will he take steps to see that this source of vitamins is reserved for the young children in view of the shortage in the supply of oranges? Major LLOYD GEORGE: That question is now under consideration.

Children Under Five

Miss RATHBONE asked the Minister of Health how many children were attending the 37 special day-nurseries set up for women employed on war work; and what was the average cost per child per week falling on public funds.—Mr. BROWN replied: I have now approved the provision of 40 day nurseries for the children of war workers with 1561 places. It is estimated that the cost to public funds will on the average be approximately 2*s*. a day for each child but exact figures will not be available until the nurseries have been in operation for some time.

1. In a letter to the *Times* of May 7 Prof. Samson Wright, chairman of the medical department of the Central Office for Refugees, said that the office has particulars of 1400 refugee doctors eligible for admission to the Medical Register under the temporary registration order. These include 750 from Austria, Germany, and Italy, 250 from Czechoslovakia, and 350 from Poland. Up to the end of March, 1941, 17 Germans and Austrians and 12 Czechs had found employment; by the end of April, he said, the total may have risen to 100.

Rear-Admiral T. P. H. BEAMISH asked the President of the Board of Education what was the average number of children attending the 86 nursery centres; the age-range of the children; and the ratio of trained and voluntary staff at each centre.—Mr. HERWALD RAMSBOTHAM replied: It is not possible to give the number of children in attendance at these centres, but they provide accommodation for about 2700 children. The age-range of the children is from 2 to 5 years. Local authorities are not asked to supply particulars of the voluntary helpers appointed, but there are at present about 50 teachers working in the centres, the majority of whom are trained. One teacher may, of course, have charge of several centres.

Mr. DAVID ADAMS asked whether substantial progress was now being made in the provision of additional nursery centres and nursery schools.—Mr. RAMSBOTHAM replied: The number of nursery centres approved has risen from 15 in December last to 94 today. It is not contemplated that additional nursery schools should be provided during the war.

Central Medical War Committee Staff

Mr. T. E. GROVES asked the Minister of Health how many members of the staff of the Central Medical War Committee were whole-time employees of the committee.—Mr. BROWN replied: Staff are provided for the work of the committee by the British Medical Association and are not employees of the committee.

Letters to the Editor

EVACUATION OF ARMY CASUALTIES

SIR,—Your special article and leading article of May 3 raise very important problems. It is astonishing that the R.A.M.C. authorities did not consider the medical history of the Spanish War worthy of close study. That war clearly served as a dress rehearsal for the Axis Powers in the use of modern tactical methods, yet the tactical dispositions of our general staff and the organisation of the R.A.M.C. seem to have remained unaffected by it. Moreover, even since the start of the present war development has been painfully slow. The R.A.M.C., which by now should be perfectly adapted to the demands of modern warfare, is still too deeply rooted in the tradition and requirements of the last world war—its inability to deal effectively with many of the difficulties that arose in Norway, Flanders and France has been too light-heartedly explained by the unexpected nature of military movements in those countries. The lack of interest in the medical history of the Spanish War becomes even more inexplicable when one remembers the important advances in traumatology that have been due directly to the efforts of Duran, Trueta, Tudor Hart, Jolly and others, all of whom gained their experience in Spain. Now that alterations in the organisation of the R.A.M.C. are at last being advocated from lessons learnt in Spain, it is surprising that the alterations, admirable as they are, should be confined to such a limited field. Surely the issue is now, not whether one small link in the field casualties may or may not be abolished but whether the time is not ripe for a comprehensive revision.

It would be impossible to outline in this letter the whole course of development in the Spanish medical services. Furthermore, it must be stressed that during the whole of the Spanish War the organisation of the medical services remained fluid, adapting itself to the new exigencies of the military situation. The author of your special article successfully deals with one of the phases in this development; he does not attempt to show the further evolutionary possibilities which were inherent in the Spanish organisation. The general principles which served as the basis for the development of the medical services in the Spanish Republican Army were as follows:—

1. There was at all times complete liaison between the medical and military authorities. This was at times so close that it amounted to a virtual unity of both commands. It extended through the whole chain of the military organisation, from the general staff down to the regimental medical officers, who were kept fully informed not only of the operative plans but also of the military perspectives, such as the chances of success of any given operation, and the consequences that success or failure would entail.

2. The medical services were not built on any preconceived and rigidly determined lines, but were given full scope to develop and grow freely. In such a way the constant elasticity which is essential in modern warfare was maintained. It is significant in this connexion that the few professional military medical officers in the Republican army were disappointing, and were soon replaced by young doctors who were innocent of the regulations.

3. An opportunity for full analysis and discussion was always given as soon as possible. This was done by means of magazines, special circulars and frequent conferences between all the medical personnel. The criticism, which dealt successively with every operational phase of the war, was at times devastating, but it never failed to achieve some improvement.

4. The scarcity of material and personnel ensured that the most economic use was made of both.

5. The personnel regarded their interests as identical with those of the army as a whole. The fundamental principle of their work was not to return as many men as possible to the lines but to help their fighting comrades to the utmost of their ability. I heard recently during a lecture given by a R.A.M.C. officer the following expression: "The more serious the casualty the less notice we take of him, because the less likelihood there is of him returning to the lines."

6. The Spanish medical services included foreign doctors who had the advantage of being able to draw on the military and medical histories of many nations. Thus the medical history of the Great War and the subsequent research in traumatology done in England, Austria, the U.S.A., Spain itself, and particularly the U.S.S.R. were all fully used.

The experience of the Spanish War, instructive though it was, is already inadequate, and cannot be applied directly by itself to the present war. Many campaigns have been fought since, and a tremendous amount of research done, and these will have to be taken into consideration when revision of our present military medical organisation is undertaken, but the fundamental principles evolved in Spain still retain their validity.

L. CROME,
London, S.E. Late D.M.S. XV Spanish Army Corps.

NARCOLEPSY

SIR,—In his letter of April 19 Dr. Nattrass suggests that Kinnier Wilson's observation of an extensor plantar response during a state of cataplexy was erroneous. He quotes in support of his belief a personal note written by the late Dr. Adie. Since unfortunately Kinnier Wilson can no longer testify on this matter, I hasten to affirm that I too was present when this patient sustained his cataplectic seizure and that there can be no doubt about the genuine character of the extensor responses. In his "Modern Problems in Neurology" Kinnier Wilson clearly said "... Dr. Critchley had hurriedly taken off the patient's shoe and sock on the left side, and testing the plantar reflex obtained a slight but definite extensor response, which he demonstrated to me and which I corroborated." The fact that Kinnier Wilson was not alone in the examination of the patient explains the fact—which surprised Dr. Wilson Gill—that so many observations could be made within the short space of ninety seconds.

MACDONALD CRITCHLEY.

BOILS

SIR,—In expressing his views as a general surgeon (*Lancet*, April 26, p. 558) Mr. Dodd ignores the significance of various skin infections in the causation of boils. As I agree with his statement "that a constructive attitude towards their ætiology, pathology and treatment is still lacking in certain of our profession" I again draw attention to a relatively common cause of recurrent boils. Examination of 98 consecutive cases (Hallam, *Brit. med. J.* 1932, **2**, 670) revealed the presence of a concurrent skin infection in 31. Of these 11 had pruritus ani, 9 scabies, 4 impetigo, 2 pediculosis corporis, 1 whitlow, 1 oil acne, 1 perlèche, 1 otitis media, 1 abscess. I do not claim that in all these the infection mentioned was necessarily the direct cause of the boil, but I feel it is impossible to deny that it may have been.

Mr. Dodd mentions the frequency of boils during the last war. I had charge at that time of a number, sometimes 100, military beds for the treatment of skin diseases. A considerable proportion of the beds was

occupied by men suffering from recurrent boils and it was noted that almost invariably the first boil appeared after the man was infected with scabies or pediculosis corporis. As at present, scabies was then very prevalent amongst the civil population. Mr. Dodd holds the view that the mode of spread by infection of the hair follicles is negligible and in favour of this contention cites the fact that he has not observed recurrence after the treatment of boils with sodium-sulphate solution; but most surgeons are familiar with the unfortunate patient who has had a boil treated with a poultice or boric fomentation and then presents himself for the treatment of numerous boils in the near neighbourhood of the original boil. I do not undervalue other sources of infection, such as nasopharyngeal sepsis, or the rôle of the resisting power of the patient, but I do plead for a thorough examination of the skin surface.

Sheffield 6. RUPERT HALLAM.

MALARIA ON BOARD SHIP

SIR,—I was interested to read the letters of Dr. Hutton and Colonel Everard Napier (Nov. 9) and of Dr. Manson-Bahr (Nov. 30) in connexion with subtertian malaria in merchant ships. At Dakar early in the war I was called over to a tanker which had been involved in a collision and saw two cases of subtertian malaria which were confirmed by several microscopic examinations. This ship owing to its inflammable nature was not allowed by the French authorities anywhere near other shipping, so that it was anchored well out beyond the roads, 3–4 miles from shore and fully 2 from the nearest other ship. Neither of these men with malaria had ever been ashore in Dakar, and neither had had malaria before, while the ship had not recently called anywhere where malarial infection would have been likely to be contracted. I think the most likely explanation in these cases, where the distance from shore is much greater than at Freetown, is that the mosquitoes are carried on board by personnel coming from shore, either on their clothing or more probably with food-supplies or other material which is continually passing to and fro.

The other point of interest is the extremely high percentage of cases of malaria at Freetown which are of the subtertian variety—probably about 75%. The fact that so many of these cases are atypical and may simulate such a variety of medical and surgical diseases makes the diagnosis without the aid of a microscope exceedingly difficult unless one continually bears in mind the probability of malaria as a diagnosis in ships which have at all recently been to the West Coast.

At sea. MARTIN STRATFORD.

HYPEREMESIS GRAVIDARUM

SIR,—In connexion with your leader of April 12 I should like to recall a paper which I wrote nineteen years ago in THE LANCET (1922, **1**, 528) on the hysterical nature of so-called pernicious vomiting of pregnancy and was taken up in your correspondence columns. I agree that hyperemesis develops from persistence and exaggeration of the physiological early morning sickness of pregnancy, but I am convinced that this persistence and exaggeration are always the result of hysteria and can always be cured by simple psychotherapy in the form of explanation and persuasion, without resort to the drastic treatment recommended by Fahmy. With simple psychotherapy the mortality is nil, in contrast with the 37 deaths in 809 cases which occurred in the last seventeen years at the Royal Infirmary, Edinburgh. In the ten years 1929–38 there was not a single death from this cause in Guy's Hospital and its maternity district among approximately 14,000 deliveries, and Mr. J. S. Fairbairn told me in 1922 that he agreed with my conclusions and that he had not seen a fatal case in the previous ten years.

The "dehydration, raised pulse-rate, depletion of urinary output, dry, furred tongue, sore mouth and sordes about the lips, ketosis, anxious facies, icterus, albuminuria, loss of weight, lowered blood-pressure, insomnia and mental symptoms" are a result of the vomiting and ought never to be allowed to develop. I have, however, seen them all disappear within a few hours of persuading an apparently moribund patient to make the necessary effort to keep down all the food and drink of an ordinary full diet, without giving the bromides or luminal, intravenous fluids and colonic lavage recommended by Fahmy. Nor should it be necessary to empty the uterus, and this was never done in any of the cases I have seen, nor in those of Mr. Fairbairn.

Oxford. ARTHUR HURST.

TREATMENT OF PRESBYACUSIS

SIR,—Six years ago you published (*Lancet*, 1934, **2**, 306) a short paper in which I gave results of treatment with the electrophonoïde method of Zünd-Burguet in 31 cases of presbyacusis. Since that time I have completed a hundred cases (47 men and 53 women), showing 100% of successes. There appears to be an association between certain forms of deaf-birth, some anomalous and insidious cases of chronic deafness occurring in middle-age, and true presbyacusis, a connexion which opens up a fresh field in the treatment of chronic progressive deafness. Unfortunately, research is wanting in the pathology of presbyacusis, but there is an undoubted connexion between it and chronic intestinal toxæmia which suggests a solution of the difficulty. Electrophonoïde treatment, in conjunction with suitable general treatment, has, in my hands, given excellent and lasting results. The reason for this success is simple and rational, since it lies in its effect upon the vascular supply of the auditory organ.

The degeneration of the nerve arrangements of the organ of hearing generally is due largely to the fact that its blood-supply is one of the circulatory back-waters in the body. The cochlear artery is small and with a lessened force to pump the blood through the organ it supplies that organ must inevitably suffer in nutrition. The massage effect of the electrophonoïde apparatus is the ideal method for dealing with the condition, massage by sound being its essential basis and the normal stimulus of the ear. It causes an active hyperæmia throughout the whole organ, resulting in increased nutrition of the cochlea.

Gerrard's Cross. MACLEOD YEARSLEY.

ESERINE AND PROSTIGMIN

SIR,—I am grateful to Dr. Laurent for his observations on the equivalent doses of eserine and Prostigmin and for having reported the occurrence of epileptic fits after administration of prostigmin to a myasthenic. I agree that the doses of eserine and prostigmin used by Russell and myself were not in every case strictly comparable, but it is difficult to determine the equivalent amounts of drugs with such far-reaching effects as the anti-cholinesterases, especially as they seem to vary with the site of action under examination. We took as our criterion the presence or absence of early symptoms of autonomic overaction, such as sweating, flushing, salivation, nausea and abdominal discomfort. The dosage needed to induce these symptoms varies greatly from case to case, but they are produced by the direct action of the drugs on normal synapses and nerve-endings. Since evidence has been accumulating that eserine and prostigmin may have a central action, we thought it better to use this effect as an index instead of the actions on the abnormal myoneural junctions of the myasthenic. Equivalent doses of prostigmin and eserine may have a similar action on epilepsy although Schweitzer, Stedman and Wright (*J. Physiol.* 1939, **89**, 165) thought that the opposite effect of the two substances on conduction in the spinal cord was due to a difference in their physical properties. Realising these difficulties and the complicated side actions of the anti-cholinesterases I have since used acetylcholine and other choline-like substances, and the results (*J. Neurol. Psychiat.* 1941, **4**, 32) are in line with the previous observations, and include the occurrence of a fit after intravenous injection of acetylcholine to an epileptic patient.

Oxford. DENIS WILLIAMS.

MEDICAL PLANNING

SIR,—The Sutton and District Medical Society have at recent meetings been giving much time to discussion of the problems that lie ahead in the organisation of medical services. In this letter we wish, as a body, to bring our views before the profession, and to give expression to doubts and dissatisfactions that we believe to be widespread. We are a society of 60 members, comprising general practitioners, medical officers of

health, specialists and medical women, and can fairly claim to represent all branches of medical opinion in this area of Surrey. However divergent our professional activities and interests, we are substantially agreed on the following points :—

1. We would welcome such evolutionary changes as might be indicated by past experience and by present and future needs, but we view with some apprehension the suggestion, indeed the threat, of sweeping reorganisation, perhaps without sufficient "ventilation" or adequate discussion or debate by the profession as a whole. Especially would we regret the handing over of the profession to bureaucratic control; we believe this would be an unhappy change for both the public and ourselves.

2. We are impressed by the fact that the B.M.A. is regarded with indifference or distrust by numbers too great to be ignored. That such an attitude exists is to be regretted, but we are convinced that this feeling is widespread and very real.

3. The Medical Planning Commission is, we think, unrepresentative in character and undemocratic in origin.

4. In view of the above we must recognise that there does not at present exist any body which commands the confidence of the majority of the profession, or can justly claim to represent it.

5. There is therefore an obvious need for such a body, to interpret medical opinion and to speak and negotiate with authority on its behalf.

6. The B.M.A. seems to be naturally the body of choice, but essentially a revitalised association, able to attract those of the profession without its gates and inspire those within.

We have, in common with many others, constructive proposals to offer as to the direction of medical progress, but it appears to us that the primary necessity is the formation of this body. Meantime we consider it of great importance that societies like our own throughout the country, or groups formed for this specific purpose, should bring these matters into discussion, and publish their views in the medical press. We feel this would be a real contribution towards the solution of our difficulties.

T. H. WHITTINGTON,
JOHN CRAWFORD,
Hon. Secretaries.

Sutton, Surrey.

SIR,—At a meeting of the Hampshire Local Medical and Panel Committees on April 23 the following resolution was unanimously adopted :—

This committee is of opinion that no findings of the Medical Planning Commission as at present constituted should be submitted to the Government for approval without the general approval of the body of the profession through the local medical committees.

G. A. E. ROBERTS,
Hon. Secretary.

Twyford, Hants.

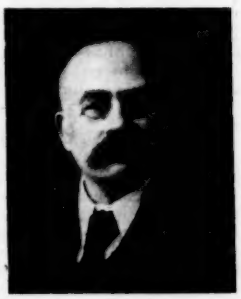
GUIDE TO ST. DUNSTAN'S.—A small pamphlet has been issued for official use explaining what St. Dunstan's is for and how patients may be sent to its hospital and training centre in the country. The hospital, which has been established for the three fighting services and the Ministry of Pensions, has at the request of the Ministry of Health become an E.M.S. hospital, and full surgical and medical treatment can be given to those who suffer from wounds or conditions of the eye which cause or threaten blindness. Ear, nose and throat and facial injuries and minor medical and surgical conditions are also treated there. Further particulars may be had from Mr. R. C. Davenport, medical commandant, c/o St. Dunstan's headquarters. The official instructions describing how service and civilian patients may be transferred to the hospital are included in the pamphlet. All persons blinded by enemy action may go to the hospital, but only officers and men and women of the Army, Navy, and Air Force, regular policemen and firemen are eligible for full membership of St. Dunstan's, though others who pass through the hospital will receive guidance and help. Information about the future care of civilians may be had from the secretary-general of the National Institute for the Blind, 224, Gt. Portland Street, London, W.1. Applications for admission to St. Dunstan's and pensions queries may be addressed to the secretary at St. Dunstan's Headquarters, Inner Circle, Regent's Park, N.W.3.

Obituary

JOHN SMYTH MACDONALD

B.A. CAMB., L.R.C.P.E., F.R.S.

Prof. J. S. Macdonald, who died on March 29 at his home in Perthshire, had held the chair of physiology in the Universities of Sheffield and Liverpool, and as teacher, administrator and physiologist he served them both well.



He was born in Dublin in 1867, the son of George Macdonald, and educated at King's School, Chester, and Emmanuel College, Cambridge, where he took the mathematical tripos in 1889. He studied medicine at the University of Liverpool, but long before he qualified he was doing research in physiology. He held the Holt fellowship at Liverpool in 1891 and was demonstrator in physiology there till 1896. The following year he was appointed to a lectureship in the University of St. Andrews at Dundee and in the same year he took his Scottish conjoint qualifications. In 1899 he was awarded the research scholarship of the British Medical Association. Another period of work followed at Liverpool at a time when the university college was negotiating for its charter as an independent university—the partnership of the Victoria University had lately been dissolved. And when in 1903 Macdonald was called to the chair of physiology at Sheffield University College, which was also aspiring to university status, his inside knowledge of university foundation stood him and his colleagues in good stead. Two years later, thanks largely to his experience and help, Sheffield received its charter, and Macdonald turned his talents to reorganising the department of physiology in the new university. He was a vital and enthusiastic teacher and imbued his students with the thoroughness and intelligence which always informed his own research. Later, as dean, for many years he guided the young faculty of medicine. His judgment of men was sure and showed itself in his selection of candidates for posts in the faculty. He was a man of strong views, at times rather hastily expressed, but he was always a loyal and unselfish colleague. In 1914 he returned to Liverpool as Holt professor of physiology and here also he became dean of the faculty of medicine. His fellow physiologists recognised his work when they invited him to preside over their section at various meetings of the British Association and of the B.M.A. and his papers on the structure and function of nerve-fibres and of striated muscles earned him the fellowship of the Royal Society in 1917. His appointment as successor to his old chief Sir Charles Sherrington gave him lasting satisfaction, and he remained at Liverpool until he retired in 1932 with the title of emeritus professor.

Professor Macdonald married Katherine Mary Stewart of Stornoway and they had three sons and four daughters.

PERCY HILDEBRAND COLLINGWOOD

L.S.A. ; LIEUT.-COLONEL, R.A.M.C. RETD.

Dr. Collingwood, who was for almost twenty years medical superintendent of the Bristol Medical Mission, died at Clifton on April 11. He was born in India in 1871, the son of Major-General C. Collingwood, and educated privately and at St. Thomas's Hospital, where he qualified L.S.A. in 1897. The following year he obtained a commission in the R.A.M.C. as surgeon lieutenant and almost at once saw service on the Nile where he was awarded the Queen's and Khedive medals. In 1903–04 he was senior medical officer in the Aden operation in the interior and his good work with the Aden boundary commission was commended. In 1910 he was promoted major and when the last war broke out he was sent at once to France. The same month he was unfortunately taken prisoner, but as his valuable services during his internment proved he knew how to make the best of a

bad job. In June 1915 he was released and the following month he returned to France where he remained until 1917 when he was sent to Macedonia. He retired from the army with the rank of lieut.-colonel in 1922 and almost at once took up his work at Bristol. Dr. Hubert Bristowe, chairman of the committee of the mission, has written of him: Collingwood was a sincere Christian and a sympathiser with the poor and suffering. Thus he won for himself a strong place in the affection and esteem of his patients as well as of the staff and committee. He not only attended to the physical welfare of his patients but also to their spiritual needs. He never troubled to get a "tin hat" and walked about during at least one of Bristol's heavy attacks bareheaded, remarking "The Lord will take care of me." He was a saintly man of simple and supreme faith.

THOMAS HOOD WILSON ALEXANDER

M.B. EDIN., F.R.C.S.E.

Dr. T. H. W. Alexander, who had practised in Elgin since 1901, died in Aberdeen on April 29, aged 63. He was born at Perth, was educated at Edinburgh University where he graduated M.B. in 1900, and he also studied in Berlin. He served as a captain in the R.A.M.C. in the last war both in this country and in Salonika. After the war he obtained the F.R.C.S.E. and in addition to his general medical work at Elgin he practised as a surgeon, drawing his patients from most of the north of Scotland. He had many interests outside his profession. He was a J.P. for Morayshire and he gave much of his time to work with the old school board and, later, with the Morayshire education authority, of which he was chairman until the introduction of the Local Government Act in 1929. Dr. Alexander had also many commercial interests, the chief of which was his chairmanship of the directors of Caledonian Associated Cinemas Ltd. which he founded and which has houses scattered from Thurso to Galashiels. He leaves a widow, one son and two daughters.

Medical News

University of Oxford

At a congregation on May 5 the following degrees were conferred:

D.M.—C. W. Simpson.
B.M.—J. C. Herapath and E. C. Hoff (in absentia).

Sir Walter Langdon-Brown will deliver the Linacre lecture to St. John's College, Cambridge, on Friday, May 30, at 5.15 P.M. The title of the lecture will be From Witchcraft to Chemotherapy.

The 105th annual general meeting of the Royal Medical Benevolent Fund will be held on Wednesday, May 14, at noon, at 1, Wimpole Street, London, W.1. Sir Thomas Barlow, F.R.S., the president, will take the chair.

In recent casualty lists Temp. Lieut.-Colonel J. C. Mackay, M.B. Edin., R.A.M.C., is posted as prisoner of war and Captain W. J. Young, M.B. Camb., I.M.S. as wounded.

During May Dr. A. J. E. Cave will give six anatomical lecture-demonstrations at the Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2. The lectures are open to all medical practitioners and senior medical students. At the first, on May 16 at 4 P.M., Dr. Cave will speak on the orbit and its contents.

On Tuesday, May 13, at 2.30 P.M., Lieut.-General A. G. L. McNaughton, president of the National Research Council of Canada, will read a paper to the Royal Society of Arts on Research in Canada. The meeting will be held at the Institution of Electrical Engineers, Victoria Embankment, London, W.C.2.

At the first meeting of the Bristol and District Divisional Hospitals Council it was announced that grants of £1000 from the Nuffield Provincial Hospitals Trust and of £1350 from the Bundles for Britain Fund had been received. The council has 88 representatives and seeks to coördinate the voluntary and municipal hospital services in Bristol and district and eventually throughout the west of England. It was decided at the meeting that a survey of the medical and auxiliary medical institutions in the area should be made.

The Robert Jones medal and prize of the British Orthopædic Association for 1940 have not been awarded.

Lord Horder has been elected president of the Cremation Society in succession to the late Duke of Bedford. He will continue to act as chairman of the council, a position he has occupied for the past six years.

A meeting of the Association of Industrial Medical Officers will be held at the London School of Hygiene, Keppel Street, W.C.1, on Saturday, May 17, at 2.30 P.M., when Dr. M. L. Dobbie-Bateman, Miss F. I. Taylor, Dr. L. S. Swanston and Dr. Graves Peirce will open a discussion on the employment of women in industry.

The Fellowship of Medicine will hold the following courses in preparation for the next M.R.C.P. examination: chest diseases at the Brompton Hospital on Mondays and Thursdays, 5.0 P.M. (May 26–June 19); nervous diseases at the West End Hospital for Nervous Diseases, Tuesdays and Fridays, 3.30 P.M. (May 27–June 20).

At the annual general meeting of the Medical Sickness, Annuity and Life Assurance Society, held in London on May 5, with Dr. F. C. Martley in the chair, it was reported that new business during the year amounted to 40 per cent. of the pre-war figures. In both the life and the sickness departments the claims had been heavier as a result of the war and of influenza in the early part of 1940; in a single month £10,000 had been paid out under the latter heading. A further £50,000 had been transferred to the war emergency reserve, making the total fund £150,000, to provide for the heavy fall in the value of assets. Holding of British Government securities had been increased from £212,824 to £387,366. The quinquennial valuation was due at the end of 1941, and while hopeful of satisfactory results Dr. Martley warned members not to be too hopeful of bonuses.

Short papers will be read at the sections of dermatology and of obstetrics and gynæcology of the Royal Society of Medicine at their meetings at 4.30 P.M. on May 15 and 16 respectively. At the section of neurology, on May 15, at 5 P.M., Dr. W. Russell Brain will speak on visual disorientation resulting from lesions of the right cerebral hemisphere and Dr. Graham Weddell on the pattern of cutaneous innervation and its relation to cutaneous sensibility. On May 2, at 5 P.M., Sir Hugh Lett will address the section of urology on forty years' experience of urology. On May 23 at the section of epidemiology and state medicine Dr. P. B. Beeson will read a paper on the prevalence of trichinosis in man. Prof. R. T. Leiper, F.R.S., Dr. W. P. Rogers, Dr. P. Clapham, Mr. J. W. G. Leiper and Miss M. Young will also speak. At 5.30 P.M. on the same day Dr. M. H. Jupe will deliver his presidential address to the section of radiology on problems of skull radiology.

Births, Marriages and Deaths

BIRTHS

FERGUSON.—On May 1, the wife of Dr. S. H. Ferguson, of Ipswich—a daughter.

MARTYN.—On April 29, the wife of Dr. M. King Martyn, of Cheltenham—a daughter.

RODGERS.—On May 1, at St. Albans, the wife of Major H. W. Rodgers, R.A.M.C.—a daughter.

MARRIAGES

BAILIE—LETT.—On May 3, in London, Hugh Cochrane Bailie, M.B., captain R.A.M.C., to Joan, youngest daughter of Sir Hugh Lett, Bt., P.R.C.S.

MARR—DAVY.—On April 26, at Limber Magna, C. Ogilvie Marr, M.B., to Pamela Davy.

VICKERS—PECK.—On April 19, at Paddington, Henry Renwick Vickers, M.R.C.P., surgeon lieut.-commander, R.N.V.R., of Sheffield, to Penelope Evelyn Peck.

DEATHS

ALEXANDER.—On April 29, at Aberdeen, Thomas Hood Wilson Alexander, M.B. Edin., F.R.C.S.E., J.P.

AVELING.—On May 4, in Cambridge, Leslie Baldwin Aveling, M.B. Camb. of Brockford, Suffolk, aged 63.

GULLAND.—On May 4, in Edinburgh, George Lovell Gulland, C.M.G., M.D., LL.D. Edin., F.R.C.P.E.

GWYNNE-JONES.—In April, from enemy action, Christabel Gwynne-Jones, M.B. Lond., wife of Surgeon Commander Tudor Gwynne-Jones, R.N.

JAMIESON.—On May 1, at Sutton, Robert Hillhouse Jamieson, M.D. Edin., F.R.C.S.E.

HARTIGAN.—On May 4, at Weybridge, John Hartigan, L.A.H. Dubl., L.M., aged 64.

KENDRICK.—On April 26, at Cheddar, Somerset, George Wharton Kendrick, M.R.C.S., captain R.A.M.C. retd.

ROCHE.—On May 6, Redmond Roche, B.A.R.U.I., M.R.C.S., L.M., of Eccleston Square, S.W.1, aged 74.

WILLMORE.—On May 3, William Southwick Willmore, M.D. Durh., M.R.C.P., D.T.M. & H., colonel I.M.S. retd., of Churt, Surrey.

Notes, Comments and Abstracts

MENTAL WELFARE IN LIVERPOOL

THE experience of psychiatric clinics up and down the country appears to be identical: the air attacks on our large cities have failed to produce the crowd of hysterics expected; there has been no panic and little mental illness which can be attributed to the exertions of the enemy. The report of the Liverpool Psychiatric Clinic for 1940 states that the small number of cases affected by the bombing have been confined to civil defence and armament workers who have experienced long and extreme stress with lack of adequate sleep. In expectation of a strain on the resources of psychiatric clinics, 18 selected volunteers were trained as auxiliary mental health workers and warned for service; so far none of them has been required to serve in this capacity. The sociological results of evacuation billeting and shelter life have given much more cause for anxiety than bombing. There has been an absolute and relative increase in the number of people under 20 for whom the help of the clinic has been needed, and it is clear that the upheaval of social life and the insecurity are having an effect on young people; this tallies with the general experience of an increase in delinquency which seems inseparable from a state of war. The report shows that the first full year of war has not curtailed the activities of the clinic, though it now has no paid medical personnel and relies on the ungrudging services of the honorary staff.

A CENTURY OF PHARMACY

SPEAKING on April 13 at the commemorative meeting of the Pharmaceutical Society's centenary, Sir John Anderson, Lord President of the Council, pointed out that while in the medical profession there is not one main organisation, but many with different functions, for pharmacists the society contrive to combine the duties of the British Medical Association, the Royal Colleges, the General Medical Council and the Royal Society of Medicine in a single organisation. The founders laid down that the duty of the society was to advance chemistry and pharmacy; the society have pursued these aims with a constancy which deserves recognition. Sir John's remark that the society had had a romantic history was confirmed by the play, *Jacob Bell and Some Others*, which Mr. H. N. Linstead, the secretary, had written for the occasion. It was produced by Donald Wolfit, and some 500 inheritors of the legacy of 1841 were as unanimous in their approval of it as were their forefathers in the craft when the resolution establishing the society was passed in the "Crown and Anchor."

Nobody will grudge the society the paper consumed by the centenary issue of its journal which runs to 134 attractive pages. War or no war, centenaries come but once in a hundred years, and the fat week was earned by lean weeks which justified a real gala number. The coloured cover depicts Bloomsbury Square as it was of old before the society chose it for its headquarters in 1841, and we look forward already to the next centenary cover which will no doubt show Brunswick Square of pre-blitz days.

A SHORT-WAVE SCREENING CUBICLE

IT has long been recognised that short-wave therapy apparatus radiates energy which causes a hum in any radio-receiving set that is tuned in to the same wavelength. As a war measure, and to prevent interference with Service radio communications, it is now compulsory to screen all high-frequency apparatus with an output of more than 10 watts. The engineering department of the G.P.O. has issued a pamphlet (C 1101) giving details of how to screen a room by coating the walls—including windows, floor and ceiling—with metallised paper or wire gauze. Doors must be specially treated so that the continuity of metal is unbroken and all exposed metal must be bonded to the screening material and earthed. It is also necessary to instal a wave trap or filter in the incoming power line to prevent interference being radiated back through the mains. These regulations govern the diathermy sets in use in most hospitals. To screen the whole room where the machine is used would be costly. Messrs. Philips have devised a cage which fulfils all requirements. It is sectional and can therefore be made to accommodate one or more pieces of apparatus and can be dismantled and moved as necessary. The cage is 6 ft. high and completely enclosed, the upper part of the walls with fine mesh, the lower with sheet metal. If the cage stands in a corner the sides next the walls are entirely metal. There is thus some privacy, but an operator working in the main part of the room can supervise treatment. The mains suppression filter and the earthing material are provided. It is a practical and relatively inexpensive device for solving a difficult problem.

IN SEARCH OF AN ETHIC

UNDER the title "After War—Peace?" (Watts and Co. 6*d*.) Mr. C. Delisle Burns, D.Lit. has collected a number of papers contributed to the *Monthly Record* of the South Place Ethical Society. He contends that moral authority, not power, is the chief motive force in every system of government, and that civilised men and women will support any public policy which seems to them morally right. Unfortunately, simple minds, confused by circumstances which they can neither understand nor control, adopt childish opinions about what is right. Thus, quite unwittingly, many people repeatedly act in a manner conducive to war. If real peace is ever to be established adequate moral standards which will make war impossible must be sought for, set up, understood and lived up to by everybody. Such standards, he thinks, should be based on an expanded concept of Christianity which in its present form is no longer wide enough to cover the complexities of modern life. Dr. Burns has some shrewd remarks to make on the merits and demerits of traditionalism. He is no pacifist, holding that it is necessary to fight in support of many things that are bad against something that is unquestionably worse. This pamphlet may contain not enough of concrete construction and too many abstract nouns to suit every taste, but it does something towards dispelling woolly and widely held notions of right and wrong and is a valuable antidote to excessive cynicism.

GLAXO laboratories are issuing an improved range of their preparations of procaine and procaine with adrenaline. Sevicaine, the new product, is suitable for minor surgery, and its activity is about equal to that of cocaine, but it has a wide margin of safety. It is available as a 1% solution of procaine hydrochloride in 10 c.cm. ampoules; 2% in 15 c.cm. rubber-capped bottles; and 2% with adrenaline (1 in 60,000) in 15 c.cm. ampoules and rubber-capped bottles.

ROCHE PRODUCTS LTD. have trebled the strength of their Benerva vitamin B_1 tablets. Benerva ampoules, formerly containing 2 mg. will be replaced by 5 mg. ampoules, and the Benerva Forte ampoules, formerly containing 10 mg. will now contain 25 mg.

A memorial tablet to Dr. Arthur Neville Cox, who died a year ago, has been unveiled at Brighton municipal chest clinic. Dr. Cox was tuberculosis officer for Brighton from 1913 to 1940, and spent much of his time in planning the clinic.

The Save the Children Fund has heard that Dr. Katherine Macphail, medical superintendent of the Anglo-Jugoslavian Children's Hospital at Kamenica, is "safe and well in Rome."

Until further notice the holidays of elementary and maintained secondary schools in London will be 8 days at Whitsun, 15 days in the summer, 8 days at the autumn half-term, 8 days at Christmas, 2 days at the spring half-term, and 10 days at Easter.

The Chief Inspector of Factories should now be addressed at Queen Anne's Chambers, 28, Broadway, London, S.W.1.

Appointments

BROADBRIDGE, H. G., M.B. Lond., coroner for the western district of Middlesex.

BURN, J. L., M.D., B.Hy. Durh., D.P.H.: M.O.H. for Salford.

DEVENISH-MEARES, MOLLY, M.B. Sydney, M.R.C.O.G.: R.M.O. at King Edward Memorial Hospital, Ealing.

HIRSCH, ERNST, M.D. Prague: outpatient and casualty M.O. at Kingston County Hospital.

LATTO, DOUGLAS, M.B. St. And.: R.S.O. at Hereford General Hospital.

MORTON, WILLIAM, M.D. Glasg.: M.O. in charge of medical service beds at Bromsgrove Public Assistance and Special Hospital.

STOKES, J. E., M.D. Dubl., D.P.H.: T.O. for Lewisham.